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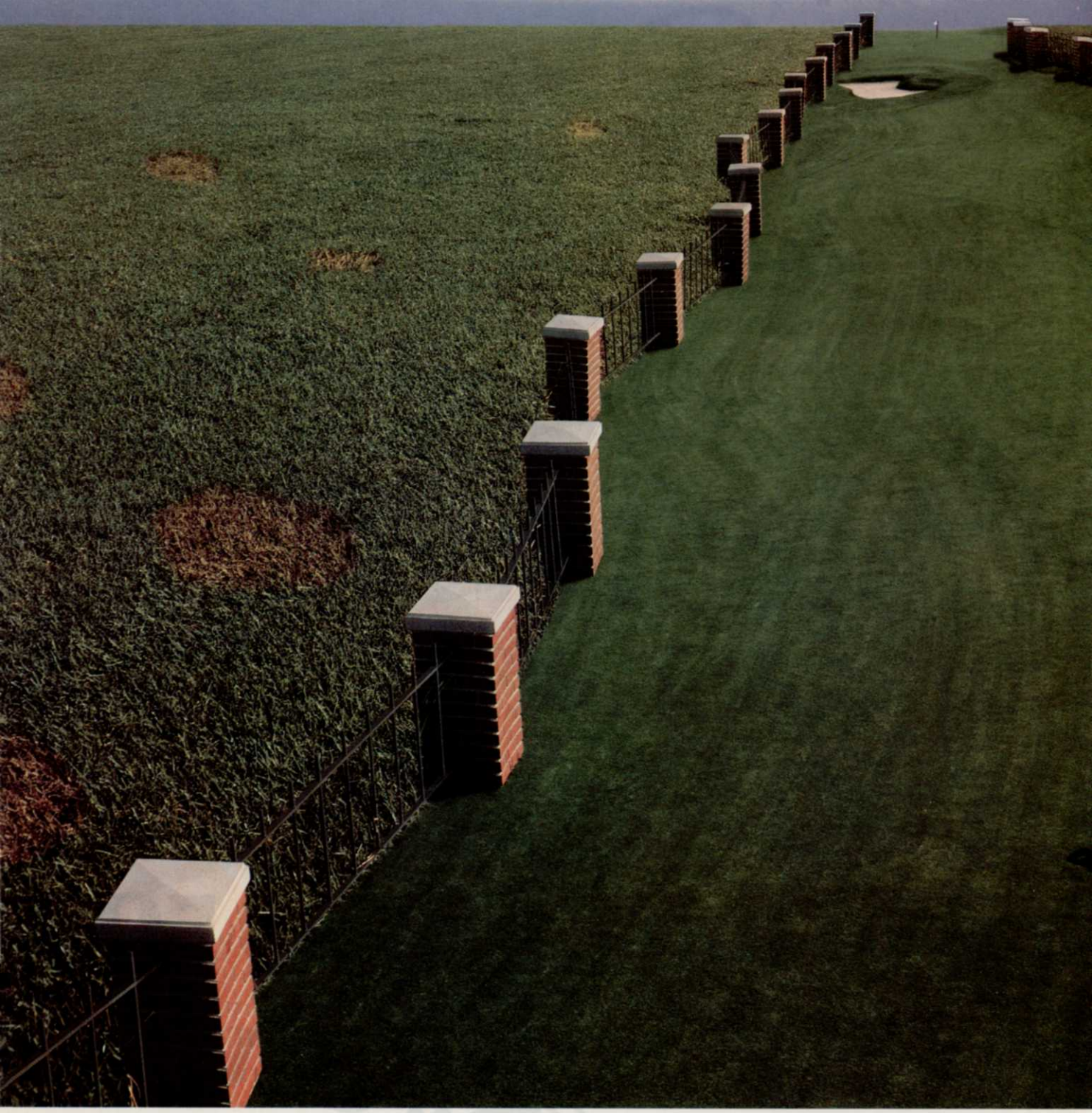

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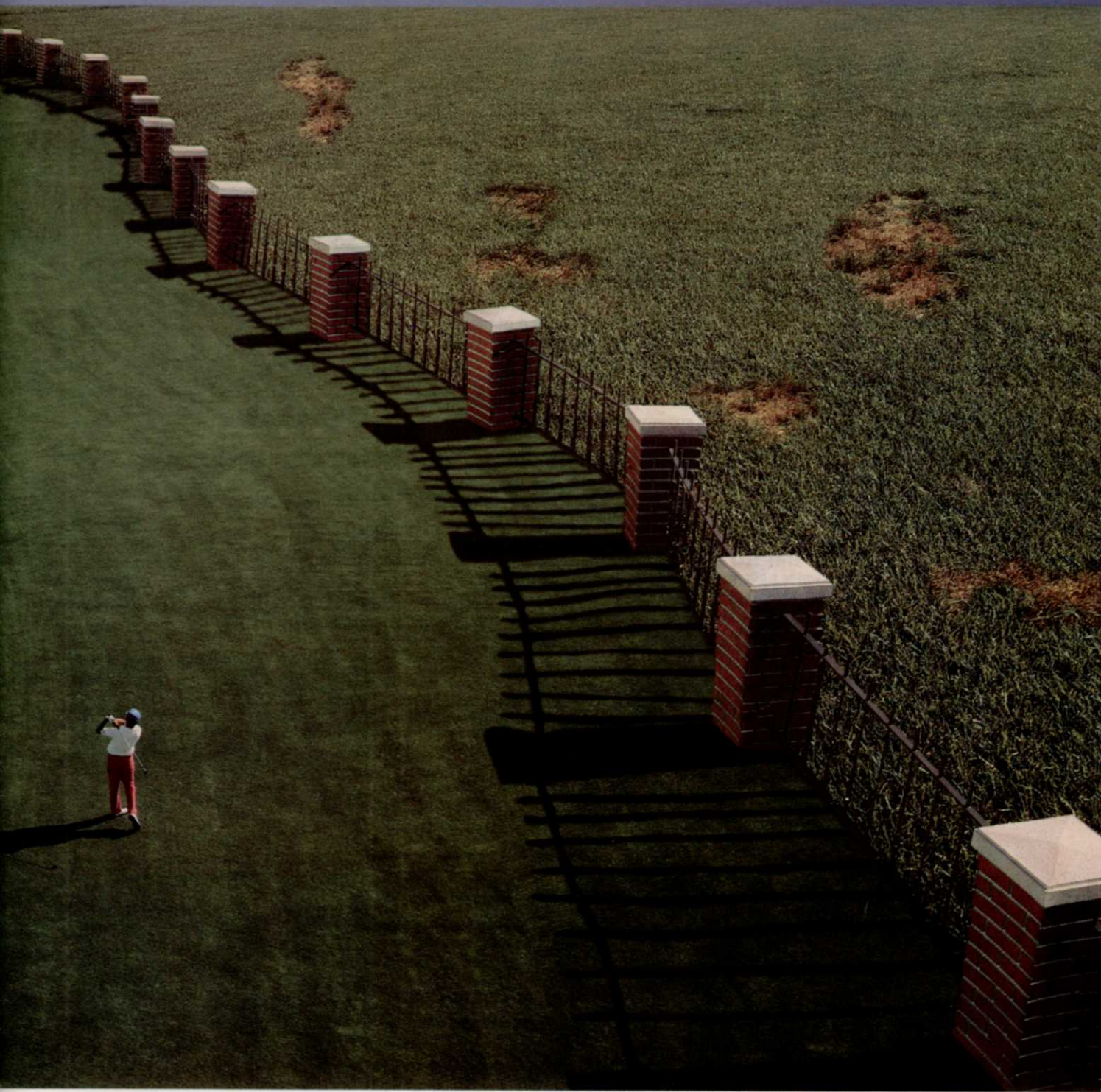

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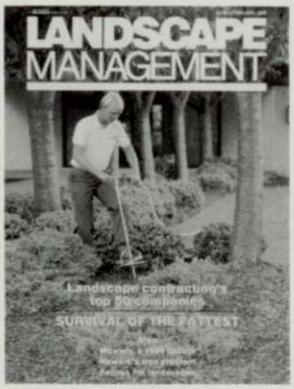
FEBRUARY 1989, VOLUME 28, NUMBER 2

LANDSCAPE MANAGEMENT



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The Rose Bowl at Pasadena, CA, January 1, 1988

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AS I SEE IT...

Brace now for change in climate

To those of you who survived the Drought of 1988:

You think you had it rough? The hot, dry weather of last summer might be a portent of things to come.

According to William W. Kellogg, Ph.D., global warming is just beginning. Kellogg, senior scientist with the National Center for Atmospheric Research, says that the warming trend should lead to a general drying out in the central part of North America—not good news for many landscape, golf and lawn care people.

"Thus, we should see more dry years in the heartland of the United States and Canada as the earth grows warmer," Kellogg says. He points out that 1983, 1985, 1986 and 1987 were four of the warmest years on record as far as the global average.

Other sources agree. *Fortune* magazine predicts that the average global temperature will rise 2 or 3 degrees by 2050. *Business Week* magazine says it will climb 3 to 8 degrees by 2040. Further, *Business Week* says temperatures in the Eastern and parts of the Midwestern United States will increase 3.6 to 5.4 degrees by 2029.

This is no small change. According to these reports, even a minimal change in average global climate will have a discernable effect on our way of life.

"The climate change in store for the world will create new and serious problems and enormous readjustments," Kellogg continues. "If we can know what to expect, we have an improved chance to survive. The biggest danger lies in complacency and the belief that somehow we can all muddle through."

There is a moral here. How will warmer weather affect your business? How did it affect your business last summer? What changes can you make to ensure a healthy business through more summers of droughty conditions?

You should begin planning now, not only for your business's welfare through the immediate coming years, but also down the road.

According to these reports, things are only going to get worse.

Jerry Roche

Jerry Roche, editor

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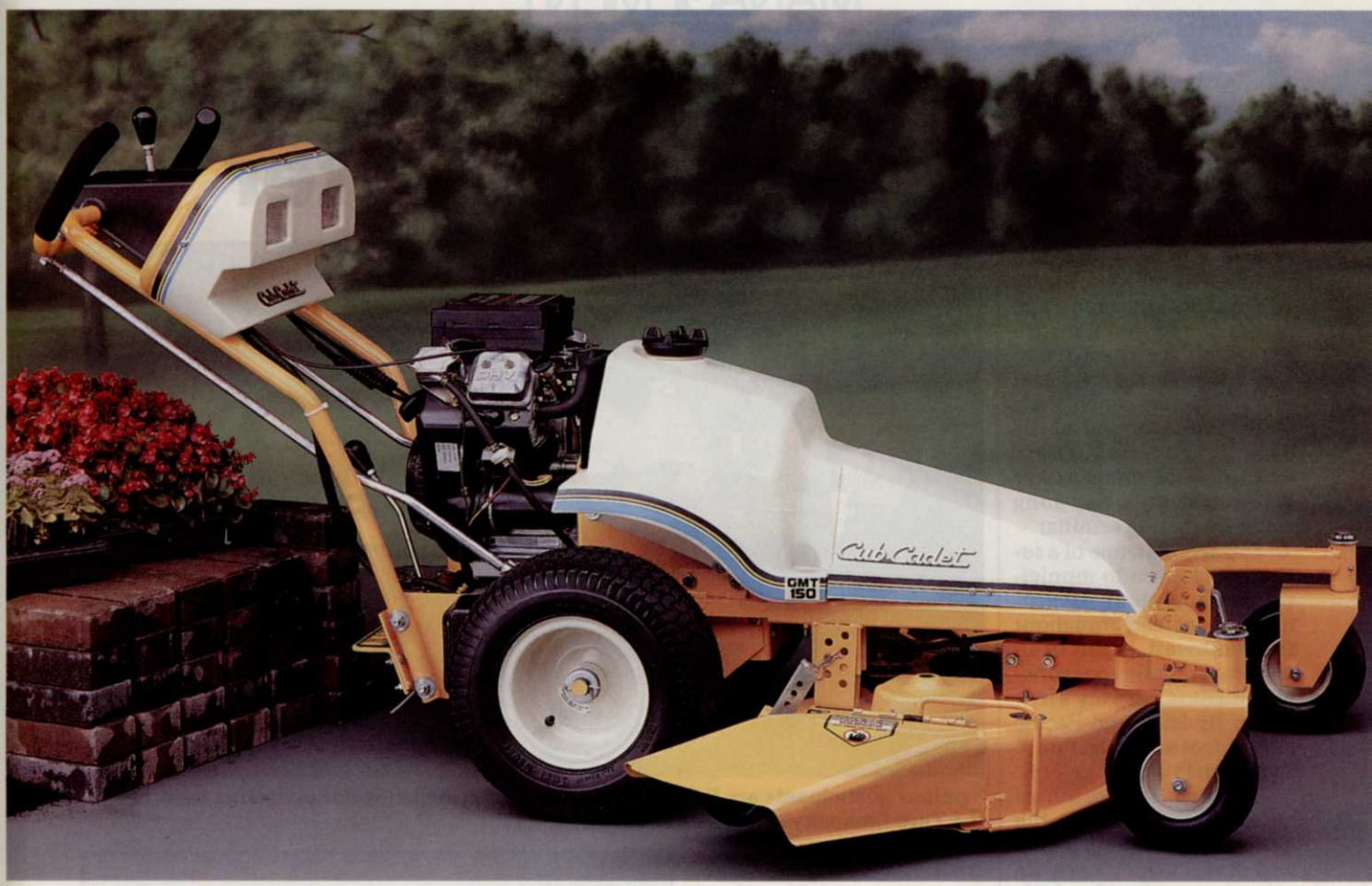

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GREEN INDUSTRY NEWS

FEBRUARY 1989, VOLUME 28, NUMBER 1

LANDSCAPE MANAGEMENT

SEMINARS

Los Angeles landscapers taught to water smarter

LOS ANGELES — Facing a mandate to cut watering by 10 percent, key landscape planning and maintenance personnel for the City of Los Angeles reacted last fall. They sharpened their water management skills and heightened their awareness of unnecessary water use at a day-long water budgeting seminar.

The seminar, one of a series being given to municipalities and other government agencies throughout the Southwest, is part of an ongoing program sponsored by the Toro Company's Irrigation Division and Pacific Equipment and Irrigation, a Toro distributor.

Richard Klink, chief landscape architect for the city's Department of Parks and Recreation, says he picked up valuable skills for determining water requirements and cost. "We're practicing better methods of programming our controllers, based on evapotranspiration rate," notes Klink, "so we are able to use the minimum amount of water necessary to keep things growing without risk of stressing the plant material.

"We have a mandate from (the Department of) Water and Power to cut back on water use at least 10 percent, and we believe we can do that just by properly programming our clocks."

Jerry Fragnoli of Pacific Equipment and Irrigation came up with the idea for the program.

"We are facing a water crisis," says Fragnoli. "The seminars are designed to help save our landscapes and our industry. It's as simple as that. For the third year, California's using more water than is being replenished by rainfall. If it happens again in 1989, there's a great possibility that the entire state may cease approving new landscaping."

Los Angeles is considering closing parks with manually-operated quick-coupler sprinkler systems, because water use cannot be accurately monitored with the systems. Also the East Bay Municipal Water District (which includes Oakland, Calif.) recently adopted regulations that severely curtail new landscape installations. □

Seminar participants are led through a series of practical water budgeting exercises in the Toro Company's day-long seminar.

INDUSTRY

Ag schools note industry for its growing importance

LAS VEGAS, Nev. — Dick Bitterman, associate dean at the University of Nevada at Reno, says more colleges of agriculture are recognizing the importance of the green industry.

Speaking at the Desert Turfgrass Exposition, Bitterman said more colleges "are working more with the students, and are turning out some of the industry's future leaders."

Bitterman also said he sees two problems facing the green industry in the near future: one, soil depletion caused by increased chemical use, and two, water conservation.

According to Bitterman, $750 million of pesticides and herbicides were purchased in 1988. "But we can't do that much longer," he warned. "A great deal our soils are being destroyed due to pollution problems.

"Water waste is another problem that will get worse before it gets better," said Bitterman. □

RESEARCH

Break up soil to lower thatch

FT. WORTH, Texas — An ironic aspect about thatch is that it can come about as a result of you doing your job well.

"In general, practices that promote vigor, growth and persistance in turf also promote thatch development. That's just the nature of the game," says Robert Green, research associate at Texas A&M University, College Station.

Thatch has a number of potential causes, says Green, including excessive nitrogen fertilization, poor drainage, a soil pH above 7 and the liberal use of broad-spectrum pesticides.

"We're recommending more judicious use of specific pesticides," says Green. "As far as watering is concerned, we need to wet it, let it dry. Wet it, let it dry. That's the kind of watering that's ideal in thatch prevention."

Green also notes that everyday practices such as mowing no more than 40 percent of the turf's leaf blade and avoiding turf cultivars prone to thatch problems (such as zoysiagrass, some Bermudagrasses and St. Augustinegrass) is a good idea.

If you have a thatch problem, engage the soil just below the surface by kicking up the thatch, says Green, as is done through aerifying or slicing. However, he adds, "Aerification should not be so severe that it takes more than 10 days for the turf to recover." It's better to aerify more often and not as deep, he suggests, when the turf is experiencing its most active growth period (in warm season climates, summer; in cool, usually the fall).

Coring, described by Green as the most effective way to control thatch, should introduce at least one hole per six inches of turf. Also, allow the cores to dry out before you reintroduce them into the soil. □

Thatch gets built up in high-maintenance turfgrass.

LAWN CARE

PLCAA starts education foundation

MARIETTA, Ga. — The Professional Lawn Care Association of America (PLCAA) recently formed the PLCAA Education and Research Foundation.

Purpose of the foundation is to enhance the public understanding of benefits of turfgrasses to the urban environment and to fund activities such as research and education to further this understanding.

The foundation's goal is to raise $100,000 in 1989.

Members of the foundation's board are: Bruce Augustin, Ph.D., Lesco, Inc.; Paul Bizon, ProGrass, Inc.; Thomas Delaney, Georgia Department of Agriculture; Robert Earley, *Lawn Care Industry* magazine; Jerry Faulring, Hydro Lawn; Mary Fischer, wife of the late Bill Fischer, PLCAA past-president;

Russ Frith, Lawn Doctor, Inc.; John Hall, Ph.D., VPI-SU; Dave Hansen, Industrial Landscape Services; Walter Houston, Encap Products Co.; Paul Moore, Lawn Green, Inc.; Martin Petrovic, Ph.D., Cornell University;

Paul Schnare, Ph.D., Accu-Grow; Robert Shearman, Ph.D., University of Nebraska; Barry Troutman, Ph.D., PLCAA; Keith Weidler, past PLCAA board member; and Ruth Ysursa, sister of the late Jim Marria, past PLCAA president.

Earley is group vice-president of LANDSCAPE MANAGEMENT magazine and Hall, Petrovic and Shearman members of the magazine's Editorial Advisory Board.

One of the original ideas in forming the foundation was in part to memorialize Marria and Fischer. □

LEGISLATION

Contracts could become standard for lawn care industry

COLUMBUS, Ohio — According to Marty Erbaugh of Lawnmark, Inc., the possibility of signed contracts going to all lawn care customers may become the rule rather than the exception in the lawn care industry.

"The wave of regulations are just beginning," Erbaugh told Ohio Turfgrass Foundation members at their annual conference. "Over 50 percent of our business is in New York where the Department of Environmental Control (DEC) has proposed signed contracts for all LCOs. You just watch it trickle to Ohio and Pennsylvania and most of the rest of the states."

Marty Erbaugh

Erbaugh said his company started to like the idea of a signed contract for all new customers. "It may have been the best decision we've ever made," he noted.

Erbaugh said Lawnmark, which had sales of $8 million in 1988, made 15,000 sales—all under contract—before May 15.

"Ninety-two percent of the verbal agreements converted to signed contracts," Erbaugh pointed out. "The other eight percent—well, they're better off being serviced by the other guy.

"The marketplace appreciated us spelling out the rules. It helped business because we created more realistic expectations at the start of our relationship with the customer."

The contract Lawnmark presents new customers is divided into eight sections: Services provided, Timing of treatments, Payment terms, Guarantee, Service calls/service continuity, Other services, Continuing service and Call ahead. Erbaugh says each section is carefully worded to suit all legal responsibilities imposed by New York's DEC.

Erbaugh believes that written contracts were part of the reason for 55 percent fewer skips and cancels from new customers in 1988 than in 1987. □

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SHORT CUTS

KEEP IN MIND...that water is the "life-giving source," says **Richard White**, Ph.D. and turf research specialist at Cook College, Rutgers University. White reminds us that 98 percent of a plant's water is transpired, and only 1.5 percent is retained in tissue and is a component of that tissue. And 70 percent of a turfgrass plant is composed of water, says White. Water is essential for nutrient transport, cooling, energy, and growth support, says White. "The role of water is life."

FORMIDABLE FESCUE...A new revolutionary tall fescue has been named Shortstop, according to breeder **Jerry Pepin**, Ph.D. for Pickseed West Inc. Shortstop is a true dwarf that has exhibited the lowest and slowest growth habit of all varieties tested at the company's research station. It has been rated one of the best varieties for overall turf quality and color, according to a press release. Shortstop will be commercially available by this fall.

FOR THE LIBRARY...is "Diseases of Trees & Shrubs," by **Wayne A. Sinclair, Howard Lyon** and **Warren Johnson** of Cornell University. "It's the best book I've seen on the topic," says **Bruce Clarke**, Ph.D. at Cook College, Rutgers University. The 507-page book is composed entirely of color plates, and is a bargain at only $49 from Cornell University Press, 124 Roberts Place, Ithaca, NY 14850.

WOMEN ORGANIZE... The Ontario (Canada) Professional Women in Horticulture meets four times a year. For more information, contact **Brenda Rice** at (416) 274-3109 or (416) 274-6918. You can write the group at 1564 Mississauga Rd., Mississauga, Ontario, Canada L5H 2K2.

DON'T FORGET TO FOLLOW UP...Rick Kuscinski believes more attention should be given to plants after they've been installed. "Eighty percent of a plant's lifespan involves management, and there hasn't been enough attention given to that area." Speaking at the Missouri Lawn and Turf Conference, Kuscinski said maintenance is a joint effort. "It's best to set up a four-season program. Establish standards for care, and zone the landscape according to degrees of care required. Document the care required during the year to maintain a continuity of landscape from year to year, especially in times of employee turnover."

A WINNER IN VEGAS...was **Robert Morris**, chairman of the Nevada Cooperative Extension. Morris received the Clark County Conservation District's Water Conservation Award for 1988, for his contributions towards promoting better understanding of water conservation. "The desert is a complex area when it comes to water conservation," said Morris. "It's considered to be a resort area, known for it's quality of life. But at the same time, we have problems with water shortages." Morris said conservation is a political and economic issue pitting the pro-legislation people against those in favor of unrestricted water use. "I just hope the two factions will find a compromise. We must strike a balance."

SHAKE, RATTLE AND...Bill Martin in Whittier, Calif., may want to change the name of his course from Friendly Hills to Rolling Hills. The epicenter of the earthquake that registered 6.1 on the Richter Scale last October was located in about the same area as the country club. "The course did fine, Martin wrote in *TurfComms*, "but some of the members' homes did not."

NEWS *from page 11*

RESEARCH

Potassium is an O-'K' element

ST. LOUIS — Paul Roberts, Ph.D., believes that too many turfgrass experts are overlooking the importance of high amounts of potassium in their turf's diet. Speaking at the Missouri Lawn and Turf Conference here, Roberts revealed results of his recent research.

Roberts found the benefits of potassium include better temperature disease tolerance and that potassium readily leaches, or adheres to and remains in sand, a feature that aids golf course supers who are converting more to sand putting greens. General benefits of potassium, according to Roberts, are improved heat, cold and wear tolerance.

"Potassium-nourished greens come out of drought well," says Roberts, which will come in handy should drought conditions continue in 1989. Roberts also credits potassium with imparting a high degree of disease resistance, and improved rooting systems.

Finally, Roberts believes potassium is essential for carbohydrate synthesis, protein synthesis, regulation of transpiration and chlorophyl development.

The tests were taken at Meramec Community College in conjunction with the University of Missouri and the Mississipi Valley Golf Course Superintendents Association. □

LEGISLATION

Reminder: OSHA remains in effect

ATLANTIC CITY, N.J. — If you haven't checked in at the clubhouse for the mail lately, you might be in the dark about the latest guidelines concerning hazardous chemicals.

Speaking to members of the New Jersey Turfgrass Association, George Hamilton, Ph.D. and

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Everett Mealman, President
PBI/Gordon Corporation

Last year, a number of progressive groundskeepers accepted the challenge to prove to themselves that they could successfully use an Embark-Ferromec AC® program on low-traffic, irrigated turf. We promised them that the program would reduce their bottom-line mowing costs by 50% or more during the 5 to 6-week period while the Embark is active, and in the process would enhance the color and thicken up the turf.

Of course, we knew the program would work because of tests conducted by university researchers, and the experience of Constant Care, Inc., one of the leading landscape management contractors in the entire midwest, who have been pioneering the use of PGRs on ornamental turf since 1985.

But never in our fondest dreams did we anticipate the enthusiam of the positive responses we have received.

Listen to Carl Schroeder, owner of Horticultural Consultants, Inc., of Shawnee Mission, Kansas. He says, "Now that we know what Embark can do, we will be aggressively soliciting mowing and maintenance contracts that we formerly would have shied away from because of questionable profitability."

Schroeder bases his optimism on his experience in testing the Embark-Ferromec AC program on the vast sweep of ornamental turf that surrounds the headquarters of Farmers Insurance Group . . . the largest and most visible piece of turf in the Kansas City area. "It's a tremendous 18.5-acre showcase for us," says Schroeder. "But, is it ever a *#'! to mow!

"There's a 40% slope on some areas that have to be mowed with a walk-behind to avoid ruts and erosion," says Schroeder. "You can imagine the expense! But, with the Embark-Ferromec AC program, we will be able to cut those costs in half, while at the same time improving the appearance . . . and we are hopeful that Embark will help strengthen the roots of the grass on those slopes."

This program is as simple as a, b, c.

First of all, the Embark is applied at the low rate (1 pt./A). The idea is to slow down the growth rather than to totally shut it off.

Second, it is tank-mixed with Ferromec AC Liquid Iron at a high rate (2.75 gal./A), which produces a vibrant green color before the Embark kicks in; hence no worry about discoloration. In fact, just the opposite.

Third, the Embark-Ferromec AC can be tank-mixed with Trimec® Broadleaf Herbicide, so it gets a free ride that even further improves the bottom line.

But wait! There's more good news: Embark is a true plant growth regulator, not a reformulated herbicide. Tests clearly show that when Embark shuts down seedhead development and stem elongation, the energy is redirected toward root growth.

Carl Schroeder, right, gives Everett Mealman a closeup view of the impressive and highly visible turf he maintains for Farmers Insurance Group. Millions of people who whiz by on I-435 see it as a thing of beauty, but Schroeder sees it as a monster for Embark to tame.

Constant Care, Inc. have been pioneering the use of PGRs for five years and were directly involved in the early tests of the Embark-Ferromec AC combination. Bill Gordon, above, director of commercial landscaping for Constant Care, says that nothing works like Embark.

Bill McGee, above right, general manager of Smith Lawn and Tree Company, used Embark/Ferromec AC/Trimec on this turf at Bedford Properties Industrial Park. "Within two days the tall fescue greened up and the mowing was cut in half for six weeks."

Does this look like a challenge for the amateur golfer? Yes, indeed, but it's even more of a challenge for superintendent Jerry Ducker, left, in the photo at right; and his assistant, Tom Addington.

Experience of a golf course superintendent

Jerry Ducker, golf course superintendent of the prestigious Hallbrook Farms Country Club in Leawood, Kansas is extremely interested in the potential problem-solving power of Embark-Ferromec AC.

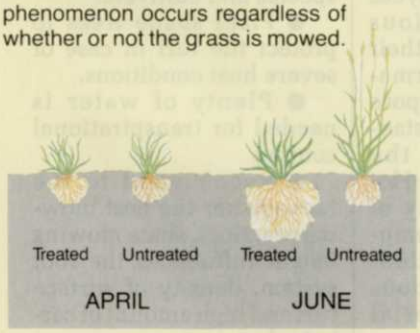
Hallbrook was designed to present a challenge. "And indeed it does!" laughs Ducker . . . "a challenge to the superintendent. For example, we've got zoysia peninsulas that extend into fairway traps that can only be mowed with hand trimmers while standing deep in sand. You can imagine what a labor-intensive job you're looking at."

With this in mind, Ducker tested Embark-Ferromec AC on some of his less-visible areas in 1988. "We're very enthusiastic about what we hope to be able to do with Embark," says Ducker.

Another Embark-Ferromec AC enthusiast is Bill McGee, general manager of Smith Lawn and Tree Company of Kansas City, Missouri. "We used it on three of the Bedford Properties Industrial Parks," says McGee. "And, within 48 hours, the tall fescue took on a rich green color, and the mowings were cut in half for six weeks."

Embark-treated grass develops deeper roots

Research shows that when grass is treated with Embark, the energy that would naturally produce seedheads and stem elongation is redirected to the roots. This phenomenon occurs regardless of whether or not the grass is mowed.



Shouldn't you try Embark?

Indeed, the evidence cannot be denied. The Embark-Ferromec AC-Trimec program is dramatically changing the economics of managing low-traffic, irrigated ornamental turf.

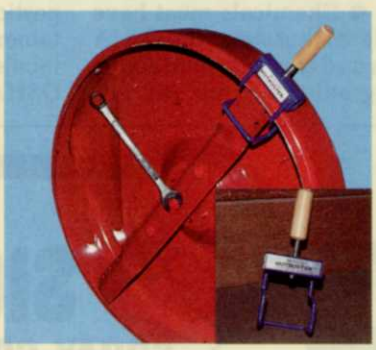
Surely you'll want to keep pace with the change and at least test the program for yourself — if only in a minor way.

If you have any questions at all about using Embark-Ferromec AC, call us toll-tree.

Toll-free 1-800-821-7925
In Missouri, 1-800-892-7281
Ask for Sales Service.

A $20.00 value for $9 when you buy Embark:

Nutbuster mower blade safety lock



This unique tool clamps to edge of mower deck to secure blade so that nut can be wrenched off quickly and safely. To receive a Nutbuster via UPS, send $9 to PBI/Gordon with your name and address and a copy of an invoice showing you have purchased one quart or more of Embark. Offer expires Nov. 1, 1989. Limit one per customer.

pbi/gordon corporation
1217 West 12th Street
P.O. Box 4090
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PLANT GROWTH REGULATOR

717-1288

Circle No. 153 on Reader Inquiry Card

pesticide specialist at the Rutgers Cooperative Extension reviewed the latest requirements brought about by the OSHA Hazard Communication Standard.

Enacted in 1983, the Standard required chemical manufacturers and importers to evaluate the hazards associated with various chemicals and to communicate these hazards to workers via Material Safety Data Sheets. Worker training, container labeling, written programs, chemical lists and maintenance of data sheets are all part of the requirement. In 1987, OSHA expanded the requirements into the non-manufacturing sector, making golf courses and lawn care operations liable in the event of non-compliance.

The three main areas of concern have to do with labelling, Material Safety Data Sheets and training.

● Chemicals must have a label that states the OSHA hazard classification, active ingredient, name and address of manufacturer. Hamilton says pesticides in original containers are exempt from the labeling requirement, however, if the pesticide is in a service container it must be properly labeled according to both OSHA requirements and state pesticide regulations for service containers.

Newly elected board members of the California GCSA discuss the GCSAA conference this month in Anaheim, Calif. Top row, from left to right are, David Lozoya, David Hein, D.J. Pakala, Tim Sedgley. Bottom row, left to right, Dave Fleming, Robert Tillerman, Melvin Summer and Paul Dias.

● Each chemical covered under the standard requires its own safety data sheet, which contains information regarding acute and chronic health effects, any physical health effects and the chemical's potential for fire and explosion. Sheets also are to provide information on proper storage and disposal techniques, specific safety precautions, medical treatment information and steps necessary to prevent excessive exposure to the chemical.

● Hamilton says information and training must be provided to employees about those hazardous chemicals present in their work area. This information includes the purpose and provisions of the standard, areas where the chemicals are in use and location and availability of the written hazard communication program, including the list of hazardous chemicals and material safety data sheets. □

LAWN CARE

Drought stress programs an issue

ATLANTIC CITY, N.J. — If the drought returns this summer, will you be ready? Robert Carrow, Ph.D. at the University of Georgia, thinks it's a good idea to focus on high temperature drought stress just in case.

"The effects of future droughts will depend on how you mold your entire program of lawn care practices," Carrow said, in remarks made at the New Jersey Turfgrass Expo.

Carrow said a drought care program is especially important considering that once the LCO leaves the property, it's in the hands of the homeowner.

"The lawn care professional has total control over what he does to correct problems, but very little control over how the homeowner cares for the lawn in his own way. Let's be sure," urged Carrow, "that we're doing all we can for the turf."

Carrow described two types of high temperature stress: direct and indirect. Indirect heat stress, the most common, happens every year.

Direct heat stress is much quicker and more harmful, and occurs when heat-sensitive proteins in the protoplasm are denatured, resulting in protoplasmic coagulation of the cell wall, which collapses.

To prevent high temperature stress:

● Irrigate properly.

● Promote hardiness by using drought-resistance species and cultivars.

● Plant shade trees to protect the turf in case of severe heat conditions.

● Plenty of water is needed for transpirational cooling.

● Recommend to the homeowner the best mowing practices, since mowing height influences the root system, density of surface turf and high amount of carbohydrate reserves.

Drought stress reduction includes:

● A good overall agronomic program. It does make a difference if you have good fertilization, weed control and insecticide programs.

● Continue to educate the homeowner. What the

SIGNAL™
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SPRAY!
See your turf dealer. If he doesn't carry SIGNAL, call or write for information and a trial sample.
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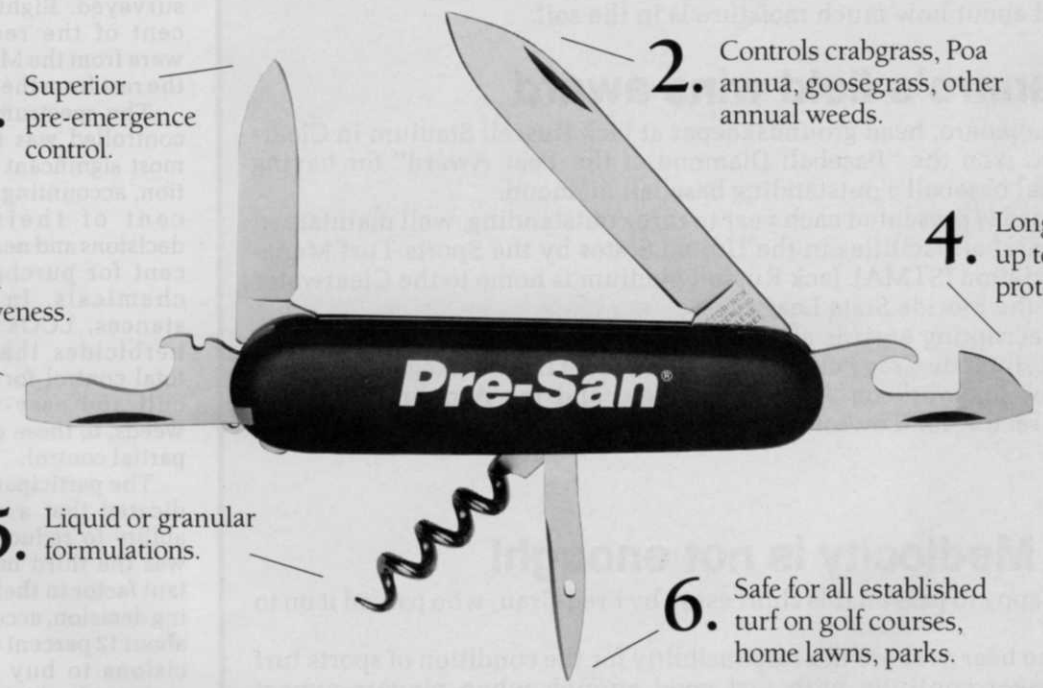

5. Liquid or granular formulations.

6. Safe for all established turf on golf courses, home lawns, parks.

7. **FREE!** Get an authentic Swiss Army knife when you purchase a minimum of $250 of PRE-SAN pre-emergence herbicide products. Send your name, address, and a distributor invoice (copy ok) to Sierra, 12101 Woodcrest Executive Drive, #190, St. Louis, MO 63141. Offer only good while supplies last, so order PRE-SAN now for superior weed control and pocket your free PRE-SAN Swiss Army knife.

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Circle No. 166 on Reader Inquiry Card

ATHLETIC TURF

Working on the ideal surface

"When you come in contact with the surface as much as you do in football, poor field condition has to be a concern." That's Penn State University head football coach Joe Paterno talking about his favorite playing surface, natural grass.

To improve athletic field conditions Don Waddington, Ph.D. and Trey Rogers have been working to develop the ideal surface. They gave results of their research at the annual meeting of the American Society of Agronomists late last year.

Most recently the pair (Rogers has since earned his Ph.D. and is an assistant professor of turfgrass science at Michigan State University) looked at cutting height and soil compaction and how they affect impact.

"There are two critical interactions between the player and the ground that determine the quality of a sports surface—hardness and traction," claims Waddington.

To measure traction, compaction and impact absorption, the researchers used a portable Clegg impact tester that drops weights from 18 inches and measures how quickly they stop.

"The Penn State research indicates that differences in cutting height of the grass are not as important in absorbing impact as the mere presence of the turfgrass itself," Waddington reports.

It is not the height of the grass so much as the amount of moisture in the ground that determines the surface's hardness. As soil moisture decreases, the importance of grass as a shock absorber increases. Practices that reduce soil compaction also become more important as the soil becomes drier.

The study concludes that for traction, field managers need to be looking at how well-developed the root system is. The deeper the roots, the better the traction. And to minimize injury from impact, managers need to be concerned about how much moisture is in the soil.

Timpanaro's field wins award

Ron Timpanaro, head groundskeeper at Jack Russell Stadium in Clearwater, Fla., won the "Baseball Diamond of the Year Award" for having professional baseball's outstanding baseball diamond.

The award is presented each year to three outstanding, well maintained and safe baseball facilities in the United States by the Sports Turf Manager's Association (STMA). Jack Russell Stadium is home to the Clearwater Phillies of the Florida State League.

Others accepting awards at the STMA's January presentation in Vero Beach, Fla., include Greg Petry, superintendent of the Waukegan, (Ill.) Park District, for his work on Al Grosche Field and Joe Ardolino, assistant athletic director, for Towson State University's Burson Field in Towson, Maryland.

Grau: Mediocity is not enough!

We're happy to pass on this short essay by Fred Grau, who passed it on to us:

"We who bear or share the responsibiltiy for the condition of sports turf can no longer continue with just good enough when players expect excellence.

"For those we serve we want to provide excellence. If the purse strings are drawn too tightly let the parents know the situation. They are fund-raisers personified.

"We can do it— just loosen the reins and say Giddyap. No athlete who has enjoyed excellence will ever again be satisfied with good enough.' "

homeowner does reflects directly on the LCO.

- Don't oversell your service. You only control half of it.
- Work with your regulatory agencies to develop favorable water-use regulations. "Without good water-use regulations, many of today's companies will be out of business in five to 10 years. Sufficient water must be there," Carrow concluded. □

PESTICIDES

What kills most sells the best

MIDLAND, Mich. — The single most important consideration when buying a herbicide is percentage of broadleaf weeds controlled, according to lawn care operators (LCOs) surveyed recently by the Dow Chemical Co.

About 100 LCOs responsible for selecting chemicals and materials for their lawn care operations were surveyed. Eighty six percent of the respondents were from the Midwest and the rest from the Northeast.

The spectrum of weeds controlled was the second most significant consideration, accounting for 18 percent of their buying decisions and nearly 20 percent for purchasing spot chemicals. In both instances, LCOs preferred herbicides that provide total control for both difficult and easy-to-control weeds, to those giving only partial control.

The participants also indicated that a chemical's ability to reduce callbacks was the third most important factor in their purchasing decision, accounting for about 12 percent of their decisions to buy broadcast and spot herbicides.

Chemical cost per acre was reported to be significantly less important than efficacy, sales support and safety. Cost accounted for nine percent of the broadcast chemical decisions and four percent for spot herbicides. The results indi-

Answers to the seven most asked questions about SUPERSORB.®

When we introduced SUPERSORB® water absorbants a few years ago we were confident that they would be successful, but we had no idea that this practical and versatile water management tool would generate so much enthusiasm among landscape professionals.

We,ve compiled some of the most frequently asked questions and answers. If your questions aren't answered here, give us a call toll-free at the number below.

Q: What is SUPERSORB and what does it do?

A: SUPERSORB is a water absorbant. It consists of acrylic copolymer crystals which absorb water to increase the moisture holding capacity of soil. SUPERSORB crystals can absorb up to 200 times their weight in water and release nearly 100 percent of their reserves as the soil dries out or plants require it. SUPERSORB keeps on working for at least two years. It is non-toxic to plants, people and animals, and is eventually metabolized by soil microorganisms.

Q: What will SUPERSORB do for me in landscape installation and maintenance?

A: SUPERSORB C lets you and your customers extend the time between waterings. It helps trees, shrubs, bedding and container plants and ground covers survive moisture stress conditions. SUPERSORB F can be used as a rootdip for bareroot plants, added to hydroseeding mixtures or used to speed the establishment of sod. So SUPERSORB saves you time and water and gives you better plant establishment.

Q: What's the difference between SUPERSORB and other water absorbants on the market?

A: Aside from SUPERSORB's unique blue color, which is helpful when mixing it into the soil, you'll find that SUPERSORB's particle size is more uniform for more predictable performance. In addition, SUPERSORB is backed by AQUATROLS' customer service and 35 years of experience.

Q: Which particle size, Coarse or Fine should I use?

A: We recommend SUPERSORB C, Coarse Particle (1-2mm) for transplanting trees and shrubs, amending the soil in beds, containers and hanging baskets. SUPERSORB F, Fine Particle (<.5mm) is used for hydroseeding, installing sod, seeding and for root dipping bareroot stock.

Q: Will SUPERSORB waterlog the soil or take water away from plant roots?

A: No to both questions. SUPERSORB expands into discrete chunks; it doesn't form a soggy mass. As SUPERSORB expands and contracts it actually helps keep the soil or container mixes open and loose. Since water must be in a free state for SUPERSORB to absorb it, water clinging to soil particles or within plant root tissues cannot be absorbed by the crystals.

Q: How much does SUPERSORB cost to use?

A: It costs about $.50 to amend the backfill for a tree or shrub with a one foot in diameter rootball.

Q: Where can I buy SUPERSORB?

A: From the turf and hort supply distributors throughout North America. If your distributor doesn't stock SUPERSORB, accept no substitutes. Call us toll free and we'll give you the name of the nearest SUPERSORB distributor.

Call us for further information, technical service or a free sample. **1-800-257-7797, in N.J. (609) 665-1130.**

AQUATROLS

The Water Management People

1432 Union Ave., Pennsauken, NJ 08110 FAX: (609) 665-0875

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Reroute roots and t
the ugly side of you

Introducing Typar® Biobarrier™ root control system.

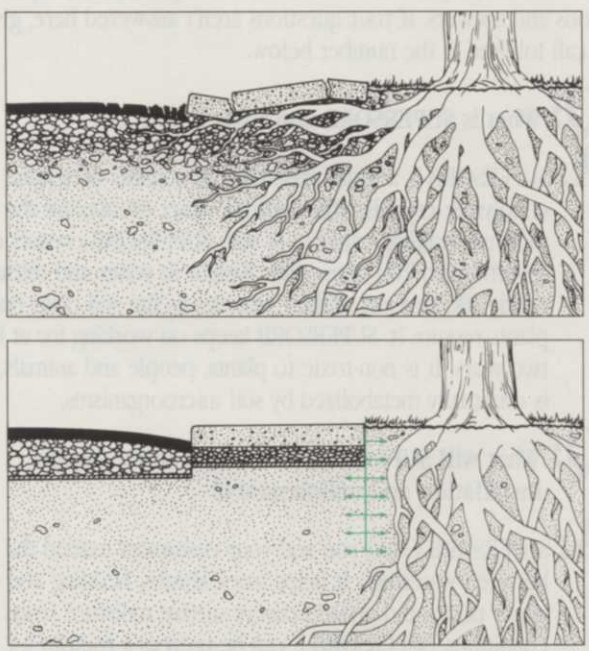
Give unsightly roots a new direction in life. Down. With new Biobarrier, the advanced root control system that sends your maintenance costs in the same direction.

Biobarrier combines two of the most effective, longest-lasting elements in root control. One is Treflan®, one of the most proven herbicides in the country, featuring new controlled-release pellet technology. The other is Typar® fabric, made with rugged polypropylene geotextile that's porous enough to let air and water through but holds the Treflan pellets in place.

Together, they reroute roots without harming your trees and plants. And preserve the beauty of your landscaped areas — golf greens, cart paths, sidewalks, curbs, walkways, parking lots, swimming pools, gardens and others — for years to come.

For 15 years or more.

Underground, Biobarrier sets up a solid rootproof zone that spans one to two inches on each side of the fabric. That's the Treflan controlled-release vapor zone. A zone so powerful, it repels roots at a controlled rate for 15 years or longer.



Top Without Biobarrier, tree roots penetrate paved surface and aggregate base, causing unsightly cracking and heaving.

Bottom With Biobarrier, a protective zone of Treflan vapor reroutes roots downward without harming roots or tree.

For half the cost or less.

By rerouting roots downward, Biobarrier protects your golf greens, cart paths, tennis courts, swimming pools and other recreational areas from unsightly roots. And helps keep your reputation in good standing among your customers.

ame
ur landscape.

The cost savings are just as dramatic. Over 50%, in fact, during Biobarrier's lifespan.

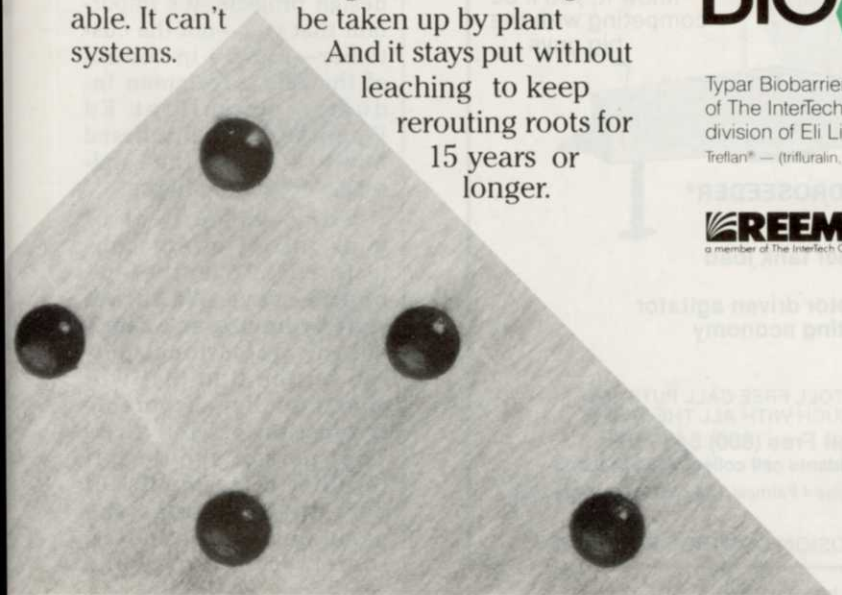
Without Biobarrier, you're spending plenty to trench, trim roots and replace damaged landscaping. And it has to be redone often to protect greens, cart paths and other landscaping.

But with Biobarrier, you'll only do the job once every 15 years — trim roots, replace damaged cart paths and install Biobarrier.

Easy on plants and landscaping.

Unlike other root control methods, Biobarrier won't harm trees or nearby landscaping. It doesn't kill roots, it just reroutes them away from your golf, recreational or landscaped areas.

Treflan's active ingredient is biodegradable. It can't be taken up by plant systems. And it stays put without leaching to keep rerouting roots for 15 years or longer.



Easy to install.

The Typar fabric in Biobarrier is flexible to make installation simple. Just install vertically along your golf, recreational or landscaped areas where tree roots threaten to bring out the ugly side of your landscape.

Call toll-free.

For the complete story on Biobarrier, see your Elanco representative. Or send for a free technical brochure from Elanco Products Company, Lilly Corporate Center, Dept. EM-455, Indianapolis, IN 46285, U.S.A. Or call toll-free: **1-800-352-6776.**

TYPAR® Biobarrier™
Root Control System

Typar Biobarrier is jointly marketed by Reemay, Inc., a member of The InterTech Group, Inc., and Elanco Products Company, a division of Eli Lilly and Company.

Treflan® — (trifluralin, Elanco)

REEMAY
a member of The InterTech Group, Inc.

ELANCO

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cated that LCOs will pay a higher price for herbicides that are more effective, better at reducing callbacks or cancellations, safer and manufactured by a company that provides business training. □

TREES

'Tree Museum' opens in Dallas

GARLAND, Texas — Under the headline "A Tree Museum," the *Dallas Morning News* reported in December that a large tract of unspoiled forest land was purchased by Dallas County and will be preserved for viewing.

The 69-acre site is home to trees more than a century old and over 100 feet tall.

Plans for the forest are still incomplete, but a trail and interpretive signs are likely to be installed, said Jim Stone, design and development coordinator for the Garland Parks and Recreation Department.

Still, the question remains, will they charge the people a dollar-and-a-half just to see 'em? □

INDUSTRY

Get a job!

DALLAS — Robert Leenhouts, general manager of Bent Tree Country Club here, recalls the time when he was involved in the process of looking for a new club superintendent. Among the dozens of resumes that made its way to his desk was a sloppily-typed sheet paperclipped to a picture of the applicant sprawled across the hood of a 1957 Chevy. He didn't get the job.

"You've got to remember that you're selling yourself, that everything you supply to a potential employer is a marketing tool," Leenhouts told attendees at the Texas Turfgrass Conference recently. That means you offer a well-prepared, neat resume (note accommpanying chart).

When you get to the interview stage, be relaxed yet enthusiastic, show up on time (if not a bit early), wearing a dark gray or blue suit. Know a little bit about the club and community, he adds. Also, anticipate the questions you're likely to be asked, such as "What are your career goals?" or "Why do you want to be superintendent of this club?"

Finally, follow-up the interview with a brief note of thanks.

When the job is offered, make sure you know exactly what it entails. "Don't fool yourself," says Leenhouts. "Don't take it if you don't think you can do it. You going to hurt yourself, you're going to hurt the club and you're going to hurt your association."

If you do accept, make sure you have negotiated the important aspects of the positions: when you start, the salary, benefits and incidentals such as moving expenses, vacation, use of facilities, etc. □

Resume dos and don'ts

RESUME DOS:

- Include name address, phone number (at work and at home).
- List professional experience in reverse chronological order.
- Stress the positive, deemphasize the negative.
- Include personal information about your spouse, children and any organizations you may belong to.
- Include information on your educational background, accomplishments and references (or a statement that they'll be provided upon request).
- Be objective about your career goals.
- Include a recent picture.

RESUME DON'TS

- Don't include information about your race, religion or political affiliation.
- Don't create false impressions. ("Remember," says Leenhouts, "if you're hired under false pretenses you may soon find yourself out of a job.")

MANAGEMENT

Tips on selling design projects

NASHVILLE, Tenn — To be successful at selling your design projects, it's important that you—not the customer—remain in control of the sale, says green industry consultant Ed Wandtke, who discussed how to do that at the Landscape Exposition here.

Since 90 percent of your initial client contacts will be over the telephone, says Wandtke, start by having an experienced, professional person on the line that will give the caller a favorable impression of your firm. That person should put together a master list of data that includes the name and sex of callers, their addresses, phone

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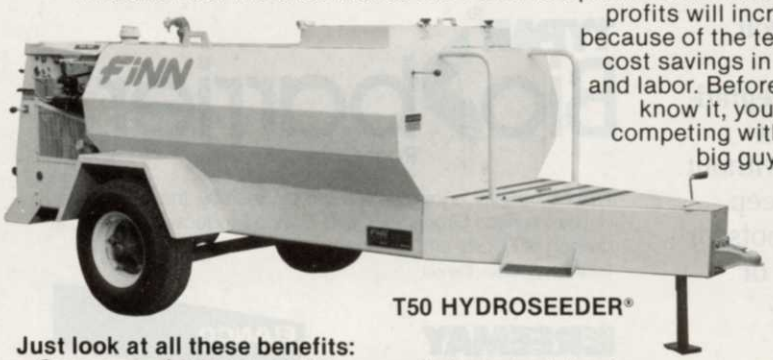
the T-50 HydroSeeder® means business.

The **Finn T-50** yields a top-notch finished job in less time and with less manpower than any other comparable machine on the market. Mixing, suspending and spraying of heavier concentrations of seed, fertilizers, lime and fiber mulches makes the **T-50** a real profit workhorse. Your profits will increase because of the terrific cost savings in time and labor. Before you know it, you'll be competing with the big guys...



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Just look at all these benefits:
- **Coverage of 6,000 to 7,000 square feet per tank load**
- **Economical, one man operation**
- **Variable speed, reversible, hydraulic motor driven agitator**
- **Option of diesel power for added operating economy**

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AMERICA'S LARGEST PRODUCER OF EROSION CONTROL EQUIPMENT.

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Grasshopper...the ultimate time-cutter.

New Gemini Series Grasshoppers put instant command in the palm of your hand!

New Gemini hydrostatic direct drive, with smooth "natural" fingertip controls, combines with our distinctive outfront design, and zero-turn-radius maneuverability to give you the ultimate time-cutting performance.

Specifically designed "turf tough," Grasshopper's new Gemini direct drive brings new standards of time-cutting performance, lower maintenance and longer service life to professional grounds maintenance.

With time-zero responsiveness, the new Gemini direct drive gives instant command with a "softer touch" of the dual-lever control system to enhance the instinctively "natural" control of speed, turns, braking and instant forward/reverse...all from the palm of your hand.

This new integrated direct drive system has been thoroughly tested for three years and proven last year in our high-performance Model 721. It is now available in all our new 700 Series mowers for 1989.

☐ Model 718 - 18 hp B & S Gas ☐ Model 718D - 16.5 hp Liquid-Cooled Diesel
☐ Model 718K - 18 hp Kohler Gas ☐ Model 721 - 21 hp Liquid-Cooled Gas

Of course, you will continue to find - and profit from the other popular Grasshopper features. Outfront PTO-driven decks and zero-turn-radius maneuverability let you trim under low-hanging trees and shrubs and between and around monuments or other obstacles. You can mow square corners or square out perpendicular to walls or fences. And, all is done quickly, easily and with totally unrestricted visibility.

Ask your Grasshopper dealer to demonstrate why Grasshopper is a Naturally Better value...or, write for additional information.

Grasshopper offers a complete line of all-season attachments, including Quik-D-Tatch® Grasscatchers (above), multi-purpose dozer blade, snowthrower, rotary broom, ROPS and cab enclosure.

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OUTFRONT SINCE 1970

GRASSHOPPER

YOUR NEXT MOWER

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numbers at home and work and a time when you can call back or meet with them.

In addition, the phone person should have a checklist on hand of the types of projects you perform. That way, they can more accurately record what type of project the caller has in mind. If it's a commercial project, get the name of the purchasing agent or building manager you'll be working with.

"If you're not getting that information, you're missing the first chance you have to sell your company," says Wandtke.

On your initial visit, show up early, take morning, daytime and evening photographs of the site and never ask the question, 'how much do you plan on spending for this project?' "Who really wants to reveal that kind of information?," asks Wandtke, who advocates offering the client a more expensive design they may finance over the course of several years.

If you're invited into the customer's home or office, make a mental note of their tastes in design. "Your mind needs to start building an inventory of ideas about what these people are like."

Here are some additional tips from Wandtke:

• When presenting the plan, let the drawing speak for itself. "Just let it happen," says Wandtke. "You can sell more effectively by waiting than you can by pushing them into an opinion."

• After the project is sold, always keep quality, price and time in mind. All your projects should be done well, but if the client wants the cheapest design possible, schedule the work for when your more important projects are finished or near completion. If they want it done right away, it should cost them more, and remember that the customer is always right, says Wandtke. "If they say, 'I can get it done cheaper,' tell them that they could have bought cheaper clothes, a cheaper car or a cheaper house. Tell them 'I don't design cheap projects. I designed one for you.' " □

RESEARCH

Researcher after the truest green

RIVER FALLS, Wisc. — Some day, millions of golfers will owe a debt to Donavon Taylor.

The University of Wisconsin-River Falls professor has spent the last three summers conducting experiments at a Falcon Heights, Minn. golf course to determine bentgrass performance in five types of soil.

According to Taylor, bentgrass is usually planted in a sand/soil mix for less compaction and better drainage. Golfers prefer sand for its truer and faster putting results. The stumbling block has long been sand's inability to hold moisture, resulting in thinning greens.

Taylor's experiments involved five different mixtures:

- 80 percent sand mixed with 17.5 percent silt and 2.5 percent clay
- 94.5 percent sand with 4 percent silt and 1.5 percent clay
- 85 percent fine mortar sand, 15 percent reed-sedge peat
- 100 percent sand with sphagnum peat tilled into the first four inches
- 85 percent uniform medium sand and 15 percent reed-sedge peat.

Taylor reports that due to the dry summer of 1988, the grass grown in 100 percent sand experienced more water stress than other mixes with lower sand ratios. Grass grown in this mixture showed water stress after 24 hours without water. Constant turf growth was a problem, even though irrigation was used almost all summer long.

Taylor believes that with more water, the green with sandy soil might have stayed as dense and healthy as the other sections. The mixtures other than 100 percent did the best and did not show any drought damage. □

INDUSTRY

Urban tree success not easy

SEA ISLAND, Ga.— Arborists should help local tree specifiers introduce the right tree into the urban environment, says Nina Bassuk, Ph.D., director of Cornell University's Urban Horticulture Institute.

The limit on space for tree roots causes compaction, which leads to nutrient deficiencies. Street salt, carbon monoxide, heat reflection from buildings and absorption of black masses such as asphalt also cause stress.

Dr. Bassuk advises planting trees adaptable to the urban environment and recommends diversification- planting no more than five percent of any one species. □

EQUIPMENT

Drought affects power equipment

OLD TOWN ALEXANDRIA, Va. — According to figures from the Outdoor Power Equipment Institute, the drought of 1988 has affected power equipment shipments.

Although fiscal 1988 shipments topped the 7 million units figure for the second straight year, a decrease of three percent over fiscal 1987 was recorded.

An OPEI press release stated, "The industry attributes the average decrease in shipments to the drought during the latter part of the shipment year (July, August).

Walk-behind mowers, in particular, showed a five percent decrease. Rear engine riding mowers remained steady while garden tractors increased 13 percent. □

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February 11-13, 1989
Anaheim, California

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THE GREAT AMERICAN LANDSCAPE SWEEPSTAKES

Circle No. 164 on Reader Inquiry Card

LETTERS

To the editor:

There has been a considerable debate on the topic of the "black death" (August, 1988 LM) and interest in the form of letters (November, 1988 LM) and articles being published in various turfgrass magazines.

As a microbiologist trained in agricultural science and presently practicing in the area of biofouling, this topic has considerable interest.

Events in 1987 at a relatively new golf course in Regina in which the black layer phenomenon occurred very rapidly led to my engagement as a consultant to determine the causes of this problem. It was clear that the rate of infiltration of water through the black layer zone was severely depressed and that both grass die-back and surface erosion was occurring in these high-sand putting greens. The nature of the black plug layer in the Regina golf course was found to be bacterial in nature. It was overlayed with molds and algae. In many ways, the type of plug that formed in the black layer resembled the plugs that occur around a water well.

In the laboratory over the winter of 1988, it became possible to synthesize the black plug layer, indicating that a black layering could be generated using simply the bacteriological components. Papers are being prepared on the precise nature of the structure of the black plug layer. The basic concern is that the bacteriological component has been either downplayed or totally ignored.

Clearly, far more research needs to be undertaken, but perhaps the phenomenon could better be referred to as "black plug layering." Black because iron and manganese sulfides are present to make the layering obvious, plug because the water infiltration through the soil is severely impeded by the biofouling and plugging of the sand, and layering because the problem becomes severe when the bacteria generates lateral layers just under the surface of the soil.

Dr. D.R. Cullimore
Regina Water Research Institute
Saskatchewan, Canada

To the editor:

Each month I look forward to receiving LANDSCAPE MANAGEMENT and thoroughly enjoy reading about the many subjects that are covered.

This month, however, I became disturbed with statements made in the article "Thorny flora makes a good fence." My assumption is that the plant referred to is *Poncirus trifoliata* (Trifoliate Orange). If my assumption is correct, I don't think the statement, "The plant was introduced to the American market 2½ years ago" and etc. is right.

Poncirus trifoliata was grown and used as a barrier hedge 60 years ago in the neighborhood near Atlanta where I grew up. In fact, the plant was so easily grown from seed, it became quite prolific. Also, in Florida, this plant has been used through the years as a root stock for grafting citrus, making the plants more tolerant of colder temperatures.

The statement "its exact identity remains a secret," is rather asinine as it is so dispersed through the Southeast.

I also disagree with the flowering cycle. As I remember, the plants which I grew bore flowers and fruit every year after it became mature. The three I retained grew to 12 to 14 feet.

M.B. Garrity
Landscape Designer
University of Florida

ED NOTE: Stephanie Slahor, who wrote the article, reports that Barrier Concepts, which markets the plant, would not reveal its identity to her, thus her statement "it's exact identity remains a secret." Barrier Concepts did, indeed, begin marketing it 2½ years ago. But Garrity is exactly correct in his assumption and other statements.

To the editor:

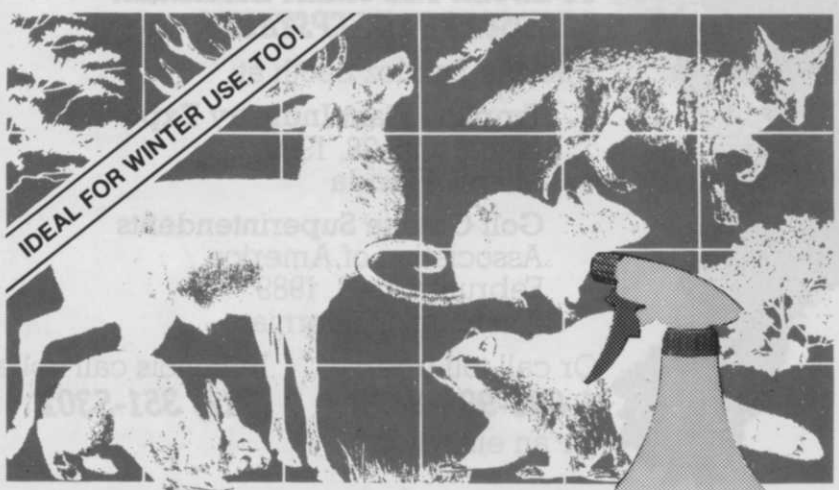
I am just reading the December issue and have read the article under "Jobtalk" regarding a so-called "great idea for a living fence."

A number of years ago, our game commission in Pennsylvania encouraged people to plant a similar plant, Multi-Flora Rose, for nature's sake. This dastardly plant has now spread and taken over farms and every other area.

This new idea sounds to me to be another like problem and should be outlawed immediately by the federal government. Leave this stupid plant in China and let them keep the problem.

John Shimmel
Rolling Green Cemetery Co.
Camp Hill, Pa.

ED. NOTE: The people at Barrier Concepts report more than 200 responses to the "Jobtalk" article, all but a handful positive.



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Circle No. 135 on Reader Inquiry Card

Golf humorist speaks at GCSAA conference

Bob Drum, golf humorist for CBS-TV sports, will address the opening session of the 60th International Golf Course Conference and Show in Anaheim, Calif. this month.

Drum has co-authored three books with Arnold Palmer and consulted on golf tournaments across the United States. He is a past president of the Golf Writers Association of America.

New officers for the Professional Grounds Management Society (PGMS) are:

Russell Studebaker, president; **Theodore H. Shull**, 1st vice president; **Thomas L. Smith**, 2nd vice president; **John Abernethy, Jr.**, treasurer; **Douglas A. Masters**, director-at-large; **Steven W. Chapman**, Northeast regional director; **Bill Starnes** Southwest regional director.

The recipient of the 1988 PGMS Scholarship is **Carol D. Goodwin**, a master's degree candidate at the University of Guelph in Toronto, Canada.

David C. Fondrie has been promoted to executive vice president of Ransomes, Inc. He supervises marketing and technical service support functions, while retaining responsibility for all financial operations.

Fondrie joined Ransomes in 1987 as vice president-finance.

David C. Fondrie

David R. White

David R. White has been named director of marketing for the Coron Corp. He is responsible for all sales and marketing efforts for the company on a national and international basis.

The Merion Golf Club of Ardmore, Pa., was recently granted an honorary sustaining membership to the Pennsylvania Turfgrass Council. The award was given to the club's memberhip and staff in recognition of exemplary contributions to the Pennsylvania turfgrass industry. It was presented during the Twelfth Annual Joseph Valentine Memorial Golf Tournament.

Accepting the award were **Scott Smith**, Merion president; **Richard Valentine**, course superintendent; **Peter Burford**, manager; and **William Kittleman** golf professional.

Robert A. Russell, was named Seedsman of the Year by the Atlantic Seedsmen's Association at its recent convention in Arlington, Va.

Owner and president of J & L Adikes, Inc., Russell began his career in the seed industry with Adikes in 1946. He was responsible for the market introduction of Adelphi Kentucky bluegrass in 1970.

The association also named **Kenneth G. Beachley**, co-founder of Beachley-Hardy Seed Company, a Lifetime Honorary Member. Beachley and friend **Bill Hardy** founded the Beachley-Hardy Seed Company in 1950. The company became a full time wholesale field seed company with emphasis on quality forage seed.

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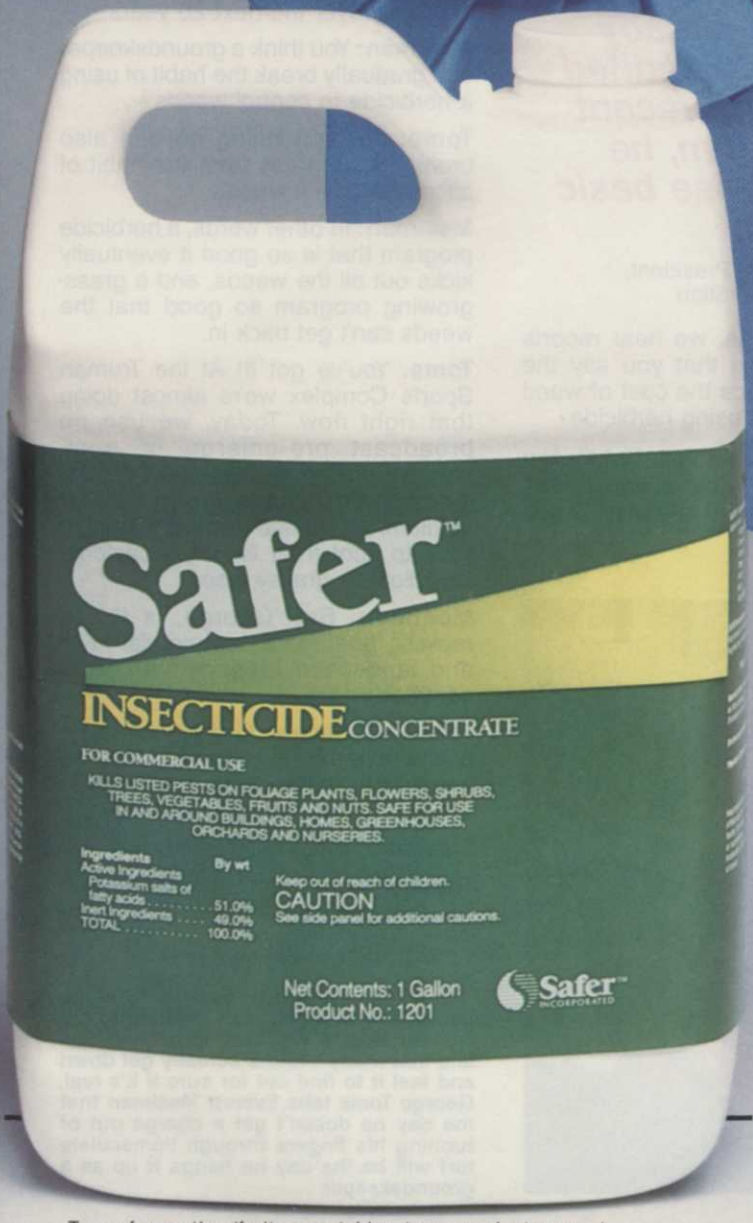
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Circle No. 161 on Reader Inquiry Card

How to reduce the cost of weed control today, tomorrow and beyond:

George Toma, Kansas City's own world-class groundskeeper, insists that most of us already know everything it takes not only to reduce the cost of herbicide but at the same time to improve the overall quality of the turf-grass. He contends that we simply need to keep reminding ourselves of those things we already know. In this edited version of a recent visit with him, he reviews those basic reminders.

Everett Mealman, President
PBI/Gordon Corporation

Mealman: George, we hear reports from time to time that you say the best way to reduce the cost of weed control is to stop using herbicide.

Toma: Yes, I've said that. But it's like the duffer who, after a bad round, said he was going to quit playing golf — not immediately, of course, but gradually over the next 20 years.

Mealman: You think a groundskeeper can gradually break the habit of using a herbicide to control weeds?

Toma: Yes, providing he can also break his turfgrass from the habit of associating with weeds.

Mealman: In other words, a herbicide program that is so good it eventually kicks out all the weeds, and a grass-growing program so good that the weeds can't get back in.

Toma: You've got it! At the Truman Sports Complex we're almost doing that right now. Today, we use no broadcast pre-emerge or post-emerge on the ornamental turf and landscaped islands around either stadium. All we use is some TRIMEC® Plus to spot treat for an occasional broadleaf or grassy weed.

Mealman: But, George, is this a realistic goal for a commercial lawn and landscape management company?

Toma: Absolutely! Of course, irrigation is a must, and you have to be involved in the sodding and seeding and fertilizing.

Mealman: What is the program?

Toma: Program isn't the right word. It's following through on the three

The Super TRIMEC treated turf on the perimeters of Arrowhead Stadium at the Truman Sports Complex is so immaculate that many visitors actually get down and feel it to find out for sure if it's real. George Toma tells Everett Mealman that the day he doesn't get a charge out of running his fingers through immaculate turf will be the day he hangs it up as a groundskeeper.

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basic fundamentals of cleaning up; keeping up; and building up.

Mealman: Can you enlarge on that?

Toma: Early spring is an excellent time to clean up . . . to clean out every weed, down to the very last root hair, so the turfgrass has a chance to thicken up. Whenever I am cleaning up some turf, I use Super TRIMEC® turf herbicide. I've never found a herbicide that does such a thorough job and yet requires such a small amount.

A big part of keeping up involves the green color you want in the spring and summer, and I always caution against using nitrogen during the growing season. Too much nitrogen in the spring and summer will result in too much top growth that weakens the roots and invites disease. To get color in the late spring and summer, I use Ferromec® Liquid Iron. Every year when they televise the Super Bowl, the announcers always rave about the beautiful color . . . that's no accident . . . that's Ferromec!

The time to build up is in the fall. That's when I pour on the fertilizer — and, if I reseed, I spray on Bov-A-Mura® (Natural Organic Activator). It does an excellent job of helping new seeds build strong roots . . . and I always use it whenever I lay new sod.

Dr. Jan Van Diepen shows a printout of a radioisotope tracer study to Everett Mealman and George Toma. The purpose of such studies is to determine the smallest possible amount of the strongest possible chemical formulation that can translocate to the root system of a weed and result in total control. Toma says, "We constantly test herbicides, and nothing is as efficient as Super TRIMEC."

Facts turf pros should know about Super TRIMEC

Super TRIMEC is a remarkable breakthrough in herbicide chemistry. To make it, we combine several esters with dicamba in a synergistic and homogenous complex in which every droplet is an exact mirror image of the total. No one except PBI/Gordon has ever been able to do this.

The esters have unparalleled penetrating power, which enables the complex to get through the cuticle and into the circulatory system of even the toughest weeds far more rapidly than other types of formulations. And once Super TRIMEC gets into a weed . . . that weed is terminal . . . period!

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Circle No. 152 on Reader Inquiry Card

COVER STORY

LANDSCAPE MANAGEMENT

SURVIVAL OF THE FATTEST

The biggest companies did the best in 1988, "The Year of the Drought," according to LANDSCAPE MANAGEMENT's third annual survey of landscape contractors.

by Terry McIver, associate editor

LANDSCAPE MANAGEMENT's survey of the top landscape contractors of 1988 finds that the larger companies were not left "high and dry" in 1988, despite adverse weather conditions. That fact serves as a testament to staying power and/or the ability to adapt.

Among those companies reporting gross sales above $3 million, the average increase in gross sales was $830,000. Smaller companies, on average, lost $55,000 in gross sales.

Environmental Industries, Inc., of Calabasas, Calif., was once again the green industry's leading contractor in our "Top 50" survey, with gross sales of $140 million. Environmental also posted the largest gain over 1987, $26 million, on 1,600 maintenance contracts. Bob Scofield, vice president of corporate relations for Environmental, attributes the growth to, "hard work, which made up for slower business in the flatter markets." According to Scofield, cities such as Denver, Phoenix and Houston, have been flat due to the decline in the oil industry.

In second place, and new to this year's survey, was Tropical Plant Lenders, Riverwoods, Ill., with sales of $35 million, followed by a third place tie between two solid companies, De Laurentis Construction and Vidosh Brothers.

The top 10 landscape contractors for 1988, based on gross sales of those companies which responded to our survey are:

1. Environmental Industries, Inc., $140 million.

2. Tropical Plant Lenders, Riverwoods, Ill., $35 million.

3. A tie between **De Laurentis Construction**, Mamaroneck, N.Y. and **Vidosh Brothers**, Sterling Hts., Mich., $18 million.

5. Carlacio Landscape, Inc., Fullerton, Calif., $16 million.

6. Davis Landscape Contractors, Inc., Harrisburg, Pa., $15 million.

7. Cagwin & Dorward, Novato, Calif., $11.7 million.

8. American Landscape Inc., Canoga Park, Calif., $11.6 million.

9. The Bruce Company, Middleton, Wisc., $11 million.

10. Landscape Contractors of Illinois, Bartlett, Ill., $10 million.

Other large gainers were **American**

TOP 50 LANDSCAPE CONTRACTORS

Landscape, Inc., of Canoga Park, Calif., (up by $3.2 million), and **Rood Landscaping**, of Jupiter, Fla. , which recorded sales of $8 million, up from last year's figure of $3 million. Rood's Tomas Aiello attributed most of the gain to the acquisition of a $3.1 million shopping mall contract.

The following is an alphabetical listing of the green industry's top landscape contractors who returned surveys. (Branch offices are in addition to a main office):

AAA Lawn Industries, Tucker, Ga., grossed $5.8 million on 375 maintenance and 30 design/build contracts. AAA employs 120 peak and 65 annual workers out of three warehouse locations.

American Landscape, Inc., Canoga Park, Calif., upped its total gross sales by $3.2 million to be one of this year's leading gainers. Total gross sales were $11.6 million, on more than 95 design/build jobs and more than 150 maintenance contracts. American employs 225 peak and 200 yearly workers, and operates one branch office.

Big Pine Farm of Marietta, Ga. grossed $7.6 million on 183 design/build jobs and 46 maintenance contracts. The company has two branch offices, and employs 240 workers during peak season, and 126 annually.

The Bruce Co., Middleton, Wisc., grossed $11 million on 500 design/build jobs and 40 maintenance contracts. Employee figures for Bruce have leapt: peak-season employees have gone from 200 to 350, and average annual staff numbers 200, up from 45 one year ago.

Cagwin & Dorward, Novato, Calif., grossed $11.7 million on 29 design and build jobs and 297 maintenance contracts— an increase of $3.2 million. Five offices employ 174 peak and 135 annual workers.

Carlacio Industries, Inc., Fullerton, Calif., has added one branch office. Its four branches completed $16 million of design/build work, with 300 peak and 140 yearly employees.

Chapel Valley Landscape Co., Woodbine, Md., grossed $9 million in 1988, which is a $1 million jump from 1987. Chapel now operates two branch offices, employing 140 peak and 90 yearly workers. Design/build jobs totalled 32 in 1988. Maintenance contracts increased to 95, a 20-contract hike over 1987.

Robert W. Childs Landscape Contractors, Inc., Arnold, Md., had a good year. One hundred fifty design/build jobs and 30 maintenance contracts grosses $3.8 million. Average number of employees for a year is 30, with 100 peak-season workers.

Clark-Morrell, Inc., of Lithonia, Ga., obtained an astounding 43 percent growth during 1988, with gross sales of $7 million. Revenue came as a result of great increases in jobs and contracts. Design and build work was up more than 100 percent and maintenance contracts totaled 175, a 52 percent leap. Interestingly, staff was cut back to 120 peak and 85 yearly workers, down from 130 and 85, respectively.

Contra Costa Landscaping, Inc., of Martinez, Calif. grossed $3 million on 20 design/build jobs and 90 maintenance contracts. It employs 50 peak and 40 yearly workers at three branch offices.

Control Environmental Services, Secaucus, N.J., estimated gross sales of $4.3 million for 1988. Fifteen design/build jobs and 90 maintenance contracts kept busy a staff of 150 peak-season employees and 60 yearly workers in one branch office.

Clarence Davids & Sons, Inc., Blue Island, Ill., grossed $4.25 million on 130 maintenance contracts and 200 design/build jobs. Davids operates one branch office and employs 125 peak and 30 yearly employees.

Davis Landscape Contractors, Inc., of Harrisburg, Pa., one of the top of the tops, grossed $15 million in sales, a $3 million increase. Contributing to the gain were more than 200 design/build jobs and 40 maintenance contracts. Three branch offices employ 250 peak and 175 annual employees.

De Laurentis Construction Co., Inc. Mamaroneck, NY, had sales of $18 million on 10 design/build jobs. The company employs 135 workers during peak season.

Designs by Lee, Inc. of Stamford, Ct., grossed $5.7 million on more than 100 design/build jobs and 40 maintenance contracts.

Doerler Landscapes, Inc., added 25 contracts, and grossed $4 million. Design/build jobs totaled 170 and 90 maintenance contracts were serviced from two branch offices by 100 peak and 50 yearly workers.

Environmental Industries, Inc., Calabasas, Calif., is once again the top contractor in the land, with $140 million in gross sales. Environmental operates three divisions: landscaping, maintenance and a tree nursery. It has 26 branch offices, and employs 2,600 workers during peak season, and 2,000 annually. Environ-

THE BEST OF THE REST

The following is a list of companies with revenues between $1 million and $3 million which responded to the survey.

Arbor Heights Nursery, Inc., Webster, N.Y.

BGT Landscape Co., Inc., Mundelein, Ill.

Bland Bros., Inc. West Jordan, Utah.

Bregenzer's, Inc., Alpharetta, Ga.

Four Seasons Lawn & Landscape, Kansas City, Mo.

Garden Gate Landscaping, Inc., Silver Spring, Md.

Greathouse Landscape Co., Inc., Nashville, Tenn.

Green Carpet Landscape, Inc., Worcester, Mass.

The Ground Crew, Arlington, Texas

L & L Landscape Services, Inc., Santa Clara, Calif.

Lifescapes, Inc., Canton, Ga.

Marvin's Garden & Landscape Service, Inc., Sarasota, Fla.

McDugald-Steele Landscape Architects & Contractor, Houston, Texas.

Oak Brook Landscape Company, Naperville, Ill.

Richway Landscaping, Humble, Texas.

SLB Lawn, Clarkston, Ga

The Spence Co., Houston, Texas.

Suburban Landscape Associates, Inc., Daveport, Iowa.

Virginia Turf Management Associates, Inc., Norfolk, Va.

White Oak Landscaping, Kennesaw, Ga.

Land Design Group, Inc., Dallas, Texas.

mental had 1,600 maintenance contracts for the year.

(**ED. NOTE: Brickman Industries**, Longwood, Ill., generally acknowledged as the second-largest landscape contracting company in the country, did not respond to the questionnaire.)

Gibbs Landscape Co.,Atlanta, Ga., earned $6 million on 1,000 design/build and 500 maintenance jobs. The company employees 150 workers at 1 location.

Greenleaves, of Chamblee, Ga., grossed $8 million on 122 maintenance contracts and 90 design/build jobs. The company has two branch offices, and employs 275 employees at peak-season and 90 year-round workers.

Greeno, Inc., Concord, Ma., boosted sales considerably over 1987. In the $2-$3 million range last year, 1988 gross sales will top out at $5 million. The company held 75 design/build jobs, and employed 65 peak and 28 annual workers.

Ground Control Landscaping, Inc., Orlando, Fla., grossed $4.2 million on 80 maintenance contracts and 25 design/build jobs. Gross sales were down slightly from 1987's $4.3 million.

The Groundskeeper, Tucson, Ariz., is new to the survey. Gross sales for the year were $5.6 million, within 2 percent of the company goal of $6 million. Operating three branch offices, Groundskeeper held 250 maintenance contracts and completed 76 design/build jobs. Average staff numbers 150; peak employment reaches 250.

Heyser Landscaping, Inc. of Norristown, Pa., posted a $1 million increase in gross sales, with $7.2 million from 76 design/build jobs and 128 maintenance contracts. Two branch offices employ 22 peak employees and 65 yearly workers.

Edmund M. Hayden, Inc., Woodstock, Ill., had revenues of $5.5 million on 12 maintenance contracts and 20 design/build projects.

Hillenmeyer Nurseries, Lexington, Ky., has 160 peak and 110 year-round employees. It posted $3.5 million in gross sales on 50 maintenance contracts. The company also operates garden centers.

D.A. Hoerr & Sons, Inc., of Peoria, Ill., completed 240 design/build jobs in 1988, and handled 5 maintenance contracts. Hoerr employs 120 peak and 80 yearly employees in two branch offices. Gross sales were $4 million.

Ireland/Gannon Associates, East Norwich, N.Y., grossed $4.5 million on about 60 design/build jobs. The company operates one branch office and employs 50 peak and 30 year-round workers.

Johnson Hydro Seeding Corp., Rockville, Md., recorded gross sales of $6.2 million, an $800,000 increase over 1987. Design/build jobs doubled to 70, which is work done mostly for building contractors. Maintenance contracts for Johnson totaled 430.

KT Enterprises, Alexandria, Va., reached $9 million in gross sales, an increase of $700,000. KT now has three branch offices, two more than 1987, and employs 380 peak and 150 annual workers.

Allen Keesen Landscape, Inc., Denver, Co., grossed $4 million on 60 design/build jobs and 175 maintenance contracts. Keesen operates two branch offices and employs 120 peak and 50 annual workers.

Lambert Landscape Co., Dallas, Texas, grossed $9.5 million from 250 design/build jobs and 100 maintenance contracts. In peak-season, Lambert employs 200 workers. Annual workers number 150.

Lancaster Landscape, Alexandria, Va., boosted sales slightly, but is still one of the largest companies. Gross sales for 1987 reached $14 million, based on approximately 300 maintenance contracts. Eight branch offices employ 450 peak employees and 250 annual workers.

Landscape Contractors of Illinois, Bartlett, Ill., grossed $10 million on 200 contracting jobs and 50 maintenance contracts. It employs 150 peak and 25 yearly workers.

Landscape Design & Construction, Dallas, Texas, operates three maintenance branches and one landscape operation. The company acquired a landscape contracting company during the year, and grossed $8.8 million from 315 maintenance contracts. During peak-season, LDC employs 350; yearly staff number 210.

When good shots end up in bad lies on dollar spotted fairways, it can spot your course's reputation.

That's good reason to put Rubigan® in play. Dollar for dollar, nothing controls dollar spot better.

Just one Rubigan application controls even resistant strains of dollar spot for up to 28 days. And one case of Rubigan will treat up to 8 acres of greens and fairways.

Rubigan is the only fungicide labeled to treat and prevent all these other turf spoilers, too: Fusarium leaf spot, necrotic ring spot, summer patch, take-all patch and spring dead spot—plus large brown patch with a Daconil 2787® tank mix.

Keep your fairways, tees and greens dollar spotless—looking clean and beautiful all season long. Get Rubigan from your Elanco distributor. Or call toll-free: **1-800-352-6776.**

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From sweet spot

...to dollar spot (!?%!)

Larchwood Construction Corp., Holtsville, N.Y., grossed $5.8 million for approximately 30 city, municipal, highway and building contracts. The company employs 75 workers duuring peak-season, and operates one branch office.

Lied's Nursery Co., Inc., Sussex, Wisc., increased gross sales to $7.5 million, up 87 percent over 1987. Totals on jobs and contracts were not available. With one branch office, it employs 210 peak and 100 year-round people.

Maintain Inc./Landscape Design and Construction, Inc. of Dallas, Texas, did a total gross sales business of $8.4 million from 310 maintenance contracts and 30 design/build jobs. The companies employ 160 yearly and 260 peak-season workers in three branch offices.

Meadowbrook of Savannah, Inc., Savannah, Ga., took in $4.2 million for 120 design/build jobs and 35 maintenance contracts. Its 20 regular employees are joined by 40 peak season workers.

North Haven Gardens, Dallas, Texas, reports $4 million in sales on 200 maintenance contracts and 12 design/build jobs. Two branch offices employ 206 yearly and 175 peak-season workers.

For **Oyler Bros.**, Orlando, Fla., sales increased by half a million dollars, hitting $9 million. Design/build jobs increased from 65 to roughly 125. Maintenance contracts, however, dropped by half, to 150. The company added two branch offices, and now has five, employing 180 workers year-round, 275 peak.

Rood Landscape Co., Inc., Jupiter, Fla., was another huge gainer, with sales of $8 million, up from 1987's total of $3 million. Design and build work was listed at 150, and maintenance contracts totaled 75.

Ruppert Landscape Co., Inc., Ashton, Md., had a good year, with total gross sales of $9 million, a $3 million hike over 1987. Maintenance contracts for Ruppert's 160 peak and 110 yearly workers totaled 101; 70 design/build jobs were completed from one branch office.

Alfred L. Simpson & Company, Inc., Atlanta, Ga., had sales of $6 million for landscape design, build and maintenance in 1988, an increase of $1 million. Simpson has no branch offices, and employs 95 annual and 125 peak season employees.

R. B. Stout, Inc., Akron, Ohio, recorded gross sales of $5.5 million from an impressive 400 design/build jobs and 280 maintenance contracts. Stout employs 160 people at the height of the season. Annual average is 40 employees.

Scapes, Inc., Marietta, Ga., had $5 million in sales for the year, with 27 design/build jobs and 34 maintenance contracts. Yearly employees number 85; peak staff is 120. Scapes operates one branch office.

Southern Tree & Landscape Co., Charlotte, N.C., grossed $6.5 million on 250 design/build jobs and 60 maintenance contracts. Southern employs 100 peak and 75 annual workers out of two branch offices.

Torre & Bruglio Landscape Contractors, Mt. Clemens, Mich., had 220 design/build jobs and 125 maintenance contracts, bringing in $3.8 million. One branch office employs 85 peak and 20 year-round workers.

Tropical Plant Rentals, Inc., of Riverwoods, Ill., is one of this year's top 10 companies, thanks to $35 million in sales from 10,000 maintenence contracts and "many" design/build jobs. It operates 10 branch offices, and employs 750 employees year-round.

Van Herrick's, of Gardena, Calif., grossed $4.3 million on approximately 950 maintenance contracts. Five branch offices employ about 100 people throughout the year.

Valley Landscaping & Maintenance, Inc., Lodi, Calif., had sales of $3.4 million on 70 design/build jobs and 50 maintenance contracts. With one branch office, Valley employs 150 workers at peak-season, and 100 year-round.

Varsity Sodding Service, Inc., Swoyersville, Pa., grossed $3.65 million on 44 design/build jobs and 41 maintenance contracts, many of which were for clients in neighboring eastern seaboard states. One office employs 82 peak and 18 yearly employees.

Vidosh, Inc., Pontiac, Mi., had a great year, with $18 million in sales. Job and contract figures were not available. Vidosh has three branch offices, one less than in 1987. It employs 250 peak and 100 year round workers.

Accepted practice in the lawn maintenance business has been to use the BIG commercial rider mower for open areas and walk-behinds for trimming. Now maintenance operators all across the country are discovering a new, fast efficient way to mow landscaped areas..for many jobs the maneuverable MID-SIZE WALKER MOWER does the whole job saving time, labor, and equipment investment. And Walker offers high productivity without sacrificing a quality cutting job, sure to please the most discriminating customer.

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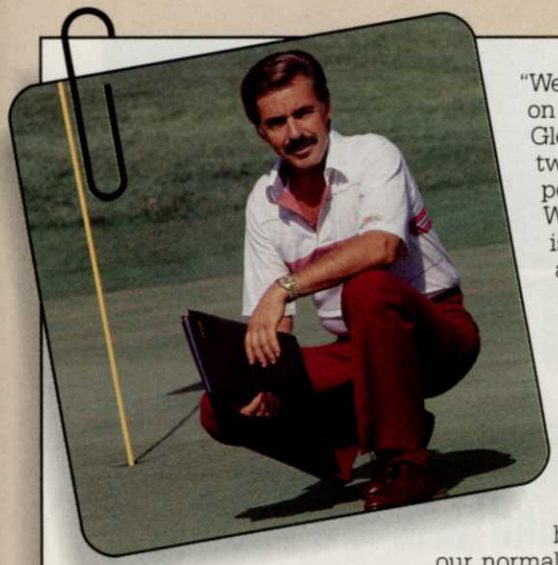
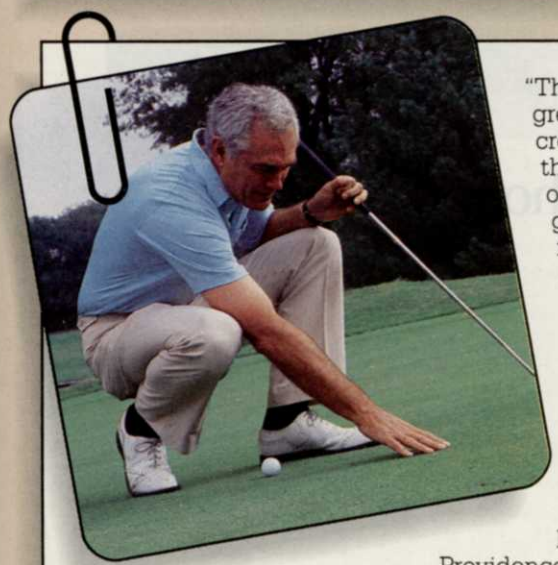
BENTGRASS



"We planted the 12th hole on Singing Hills' Willow Glen Course to SR 1020 two years ago, and it performed admirably. What's really significant is that members keep asking what we've done to the 12th hole that makes it putt so well! The members like SR 1020's performance from the players' point of view; we like that too, but we also value that we haven't had to change our normal greens maintenance program to achieve the results."

David Fleming

David Fleming, C.G.C.S.
Superintendent, Singing Hills Country Club
El Cajon, CA



"The newer golf course greens planted to Penncross look beautiful, but they don't putt like the old South German Bent greens. The putting surface of those old greens is fine-textured, not thatchy or grainy, and the old greens don't show the spike marks like Penncross. We've been needing bentgrasses bred for golf quality as well as turf quality for a long time, and it looks like SR 1020 and Providence fill the bill!"

Peter Trenham

Peter Trenham
President, Philadelphia Section PGA
St. David's Golf Club
Wayne, PA

Finally! New Cultivars Bred To Meet the Needs of the Superintendent and the Golfer!

At Seed Research, we listen to your needs. You've been wanting a bentgrass that's tough, looks great, and is easy to maintain . . . but one that's also fine-textured, with good putting green quality. And available.

So when the bentgrass shortage became apparent in 1983, we acted quickly and acquired parental germplasm from two of the finest bentgrass collections in the country – the University of Rhode Island and the University of Arizona. From those collections, we developed two exciting new creeping bentgrass cultivars, Providence (SR 1019) and SR 1020.

Evaluation on golf courses and at universities has shown that both these bents produce the kind of turf you demand: dark green, aggressive, competitive, easy to manage, good disease resistance, good stress tolerance, and compatible with existing bents for overseeding.

And, for real golfers like Peter Trenham, SR 1020 has proven it provides everything desired in a putting green bent: fine texture, uniform surface, and most importantly, an absence of grain, so the ball holds the line for true putting accuracy.

SR 1020 is already in production, and excellent quantities of certified seed are available. Providence will be available in August of 1989. With either of our exclusive new bentgrasses, you can look forward to a good-looking grass that will give you the performance you demand and the putting green quality your golfers prefer!

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A Scott's Tech Rep has a rather different set of priorities.

He puts his lawn ahead of his home. He puts his job ahead of himself. And he puts solving a problem ahead of making a sale.

Those priorities carry over into how we do everything at O.M. Scott.

Like our emphasis on developing new products instead of just selling old ones. And our belief in keeping our customers as

How a Scott's Tech Rep shovels snow.

well-informed as our own people.

The result is that with Scotts® products you always get a little more for your money.

And we haven't met a turf manager yet who doesn't consider that a priority.

For more information contact your Scott's Tech Rep or call 1-800-543-0006.

Scotts® ProTurf®

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NEW AND IMPROVED

With 1989 comes new and improved mid-size riding mowers. LANDSCAPE MANAGEMENT takes a look at some of the innovations that landscape managers will see in their dealerships this spring.

Bunton's BR 61 is an 18 hp rider with an Onan engine.

The Pro Star now comes with a new, wider 60-inch deck.

As commercial/industrial acreage gets bigger, so do the commercial riding mowers responsible for keeping the grass neat. So says Mike Packer of the Bunton Co., one of the makers of this type of mower.

"I think what we're seeing is a step up in size of mowers," Packer tells LANDSCAPE MANAGEMENT. "Guys using a 21-inch walk-behind are stepping up to 32-, 36-inch mowers. Those using 36-inch mowers are going up to 48 and 52."

This type of equipment is known in the industry as the mid-size rider.

"Why?" asks Packer. "Productivity. Companies that are stepping up into larger properties need the larger capacity machines, but something that's affordable. The nature of the business is that they make a lot of money, but never seem to have it (to spend on new equipment)."

Because the equipment is getting larger, it also pays to be more maneuverable to eliminate the need for trimming. That's the main reason why landscape managers are seeing more zero-turning radius mowers on the market.

Dixon, pioneer in the zero-turning radius field with its ZTR model, has lately been seeing more and more competition in this market.

President Bob Foutch of Pro Star, which entered the zero-turning market in 1988, sees a big future. "Zero-turning radius mowers are the coming thing," he says. "They can do so many more things. And as we go along, I'm sure we'll continue to make improvements."

Joe McDonald, marketing coordinator for John Deere's commercial division, disagrees with the current zero-turning mindset. "We've looked at zero-turning radius mowers, but don't think the benefit is there," McDonald says. "They aren't as operator-friendly or safe. The major point to consider with a front mower is its ability to trim. Zero-turning mowers are fine if you're in the middle of a field."

It seems, too, that landscape managers are demanding more versatility from their mowers. Available attach-

For the long run.

Introducing a powerful new force in riding rotary mowers.

Now there's more to Cushman® Front Line® Mowers than top cutting performance. More power. More operator comfort. More endurance.

Now there's the new diesel-powered model Cushman 807.

Its totally integrated power train and new hydraulically-powered steering gives you unmatched performance over the long run. The 807 dispatches thick, wet grass on tricky maneuvers around obstacles without losing ground speed. No other rotary mower gives you a cleaner cut.

At the heart of the new, four-wheel 807 is a powerful 21.5 horsepower, 3-cylinder Kubota 950 diesel engine. We've also included a heavy-duty Donaldson air cleaner and a new, heavy-duty Cushman PTO clutch to keep your new Cushman Front Line running longer. A complete family of Cushman Front Lines and a wide range of accessories are available to meet all your needs all year 'round. Choose a 3 or 4 wheel design with 60- or 72-inch side or rear discharge mower deck. Or add the exclusive Cushman Grass Caddy™ system, which lets you cut, catch, and hydraulically dump 16 bushels of clippings without leaving the seat.

For a convincing demonstration contact your Cushman dealer today. Or call toll-free: 1-800-228-4444.

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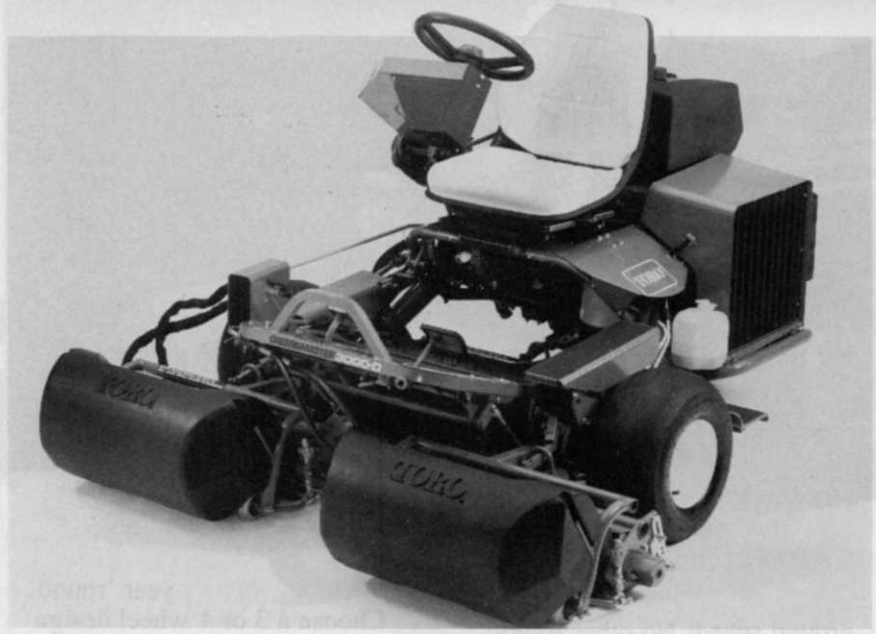
Exmark's 3150 comes with a 54-inch deck.



Toro's Greensmaster 3000-D has a liquid-cooled diesel engine.

Cushman's new Core Destroyer attachment does exactly that.

ments are playing a larger role in buying decisions. Cushman, for example, has a new Core Destroyer attachment for its Front Line series. Kubota and Wheel Horse have added sweeper and snowblower attachments.

From the landscape manager's point of view, no matter what kind of equipment "Iron Country" (LM first coined the term, meaning equipment manufacturers, in 1984) turns out, there are other considerations in buying.

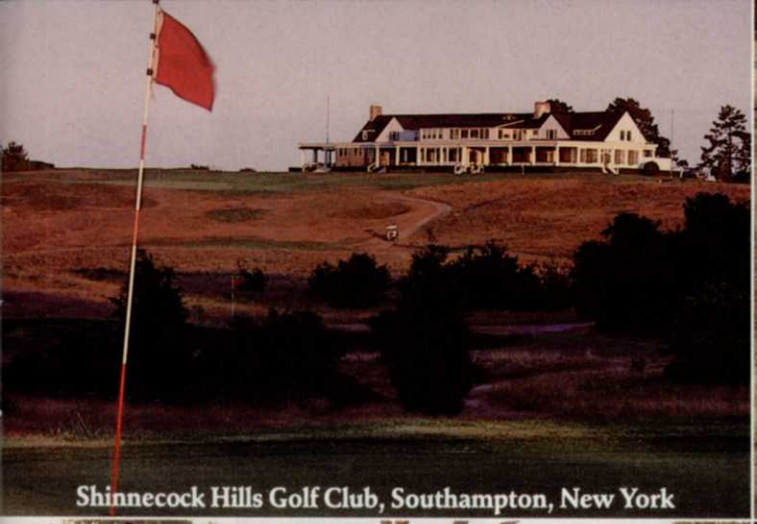
For instance, Russell Studebaker, new president of the Professional Grounds Management Society, says many landscapers consider their equipment budget, existing inventory and labor budget before buying. Studebaker, senior horticulturist for the City of Tulsa, Okla., integrates herbicides for trimming with his string trimmners and his Toro Groundsmaster mowers.

"Once we find something we like, we like to stick with it because of parts inventory," Studebaker tells LANDSCAPE MANAGEMENT. "We want something that's well-built."

Engines make a big difference to Peter Scholz of Vidosh Brothers, Sterling Hts., Mich. "I prefer diesels. They're more durable. Our entire fleet is Ransomes diesels. We have some diesels mowers with 1000 hours of use and we haven't touched (repaired) them."

He says his Ransomes mowers are also maneuverable and easy to operate. "They are able to do the big jogs and at the same time get into the small areas," Scholz notes.

Mark Yahn of Ground Control Landscaping, Orlando, Fla., also pre-



Shinnecock Hills Golf Club, Southampton, New York

Southern Hills Country Club, Tulsa, Oklahoma

Oak Tree Golf Club, Edmond, Oklahoma

Medinah Country Club, Medinah, Illinois

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Or, maybe the reason is Betasan is the only preemergent crabgrass control that's safe for bentgrass and all other turfgrasses, including established bluegrass, fescue, perennial, annual rye, bermudagrass, Zoysia, bahia, centipede and St. Augustine.

Either way, for over 20 years Betasan has been earning the trust of the most demanding and knowledgeable golf course superintendents in the country.

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MID-SIZE RIDING MOWERS—New for 1989

COMPANY	ROTARY/REEL	MODEL	COMMENTS
Brouwer	Reel		New triplex riding reel with 76-inch swath
Bunton	Rotary	BR 61	18 hp riding mower with Onan engine; rear-wheel steer, electric lift-cutter deck; 61-inch cut
Cushman	Rotary	Core Destroyer	New attachment to Front Line mowers; badknife hammer blades powder cores
John Deere	Rotary	Groundsmaster 200 series	(52-,62-, 72-inch cut) has new liquid-cooled Mitsubishi gas engine to complement diesel
	Rotary	Groundsmaster 322-D	(72-inch cut) with liquid-cooled gas or diesel engine has new four-wheel drive added
Excel	Rotary	Hustler 640 Hillsider	72-inch heavy dual-trim mower with closed look traction drive system
	Rotary	Hustler 251 K	Free-floating rear-discharge 51-inch mower with 3 V-belt-driven blades; up to 9 mph
	Rotary	Hustler 320, 340	320 has 3-cylinder engine, 340 has 4-cylinder engine; both have either 60-inch 3-way blades, 72-inch standard deck or 72-inch dual trim rotary attachments
Grasshopper	Rotary	Model 411	35-inch co-mercial deck; 4 models ranging from 18 to 21 hp
Grazer	Rotary	EM 52	52-inch 3-pt. tow-behind with PTO drive available next summer
	Rotary	EM 62, 72	Same as above, but with 62- or 72-inch swaths
Howard Price	Rotary	Turf Blazer 727	Diesel-engined with 60- or 72-inch side or rear discharges
	Rotary	Sunstrand Model 15	New model that mows up to 3.8 acres/hr.
Kubota	Rotary	S2400	New sweeper and snow blower attachments
	Rotary	G series	New four-wheel steering; gas and diesel engines
Lesco	Rotary		New zero turning radius 52-inch rotary with unique dual articulating deck, rear bagger, 18 hp Kohler engine
	Rotary		Same as above, 36-inch cut; available late 1989
	Reel	300 Greensmower	Added dynamic braking, improved power steering; 60.75-inch cut
Locke	Reel	Model 6C	New 70-inch triplex with pneumatic drive and 5 or 8 hp Honda engines
	Reel	Model 1	87-inch with hydrostatic drive has improved hydraulic cooling system and optional Honda engine
	Reel	Model 4	77-inch; same as above
Pro Star	Rotary	Model 620	New 60-inch ZTR deck
Scag	Rotary	12½ hp Hydro	Adds 12½ hp with 40- and 48-inch decks
Toro	Reel	Reelmaster 216	New three-wheel drive, now with 11 blades to go along with 5, 8; 72-inch cutting width
	Reel	HMR	New 44-or 52-inch with dual transmission steering for tight-circle steering without scuffing; three-blade decks
	Reel	Greensmaster 3000-D	New diesel power
Walker	Rotary	Model C	16 hp mower with built-in grass-catcher, 3,000-hr. life span
Wheel Horse	Rotary	Model 724 Z	New; following attachments: 60-inch side-discharge deck, 50-inch side discharge, 6 cu. ft. vacuum, 48 inch snow blade
Woods/Hesston	Rotary	Models 3150, 2650	Straight transaxle drive added, along with regular chain drive

Gas or diesel engines are available for Kubota's G series.

fers diesels because of more efficient fuel consumption and longer engine life. He approximates the diesels have five to six times the life of gas engines.

"We have some diesels we bought in 1983 that have yet to be given a major overhaul," he says. "Our average hour life on a 24 hp diesel is 5000 to 6000 hours."

Yahn also looks at overall speed, which is a combination of ground speed, maneuverability and acre per hour. "Because of the large amount of turf we need to cover in a week, speed and maneuverability must be combined with durability," he notes. "We look at deck strength quite a bit. The gauge of the metal has to be able to withstand constant sandblasting. The front of the deck functions as a bumper, so it must be strong, well reinforced."

Yahn also looks at caster wheel assemblies: "We always order our equipment with the heaviest type caster wheels they make, along with any optional items, like anti-scalp rollers, to get the deck to float in as many directions as possible to prevent scalping, but also to get the floating effect."

In overall construction, Ground Control likes a liquid, differential-type axle. "The Ransomes and Hustlers all have shaft drives; universal joints, shafts going down to the axle driving the wheel," notes Yahn.

Finally, comfort is very important. "Those guys sit on those machines for 45 to 60 hours each week," Yahn says. "If the machine isn't comfortable, you'll go through people left and right." **LM**

Sabre *Poa trivialis* isn't just a good shade grass.

It's the best.

Years ago fine fescue was considered the best performer in damp shade.

That changed with the appearance of *Poa annua*-free Sabre *Poa trivialis* and a 1979 shade tolerance trial at Ohio State University.

In that test Sabre was top-rated for shade tolerance when compared to 39 mixtures, blends and monostands of fine fescue, ryegrass, Kentucky bluegrass and tall fescue.

An excerpt from trial data said: "Sabre, which had the highest overall seasonal ratings, maintained the most consistent quality throughout the season."

Due to its special qualities Sabre should be sown only in damp shade. For this purpose it may be mixed with fine fescue, turf-type ryegrass or Kentucky bluegrass.

Normal cutting height is 1-1/2 inches, but on winter putting greens in the Southern U.S., it has proven its ability to thrive when cut at 3/16th.

One of the first domestic varieties to be registered with the U.S. Plant Variety Protection Office, Sabre is both disease-resistant and hardy.

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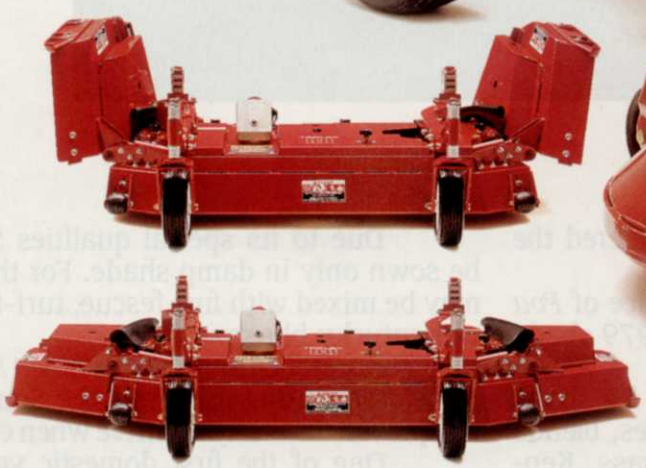
If You Can't Raise I

Imagine an out front rotary mower that is so productive that customers ask you not to change a thing. That's exactly the case with the Groundsmaster® 300 Series from Toro. For 16 years they've been the industry standard because of their unmatched power, productivity and maneuverability.

So instead of changing a good thing, we're simply giving you more of it by adding some new features.



Toro's Triflex® 88" cutting deck can increase your cutting productivity approximately 22%. And it's retrofittable to other Groundsmaster 300 Series units.

The Triflex lets you choose an 88", 72" or 54" width of cut without stopping. So for large acreage mowing with or without obstacles, the Triflex deck gives you added flexibility in addition to expanded cutting capacity.

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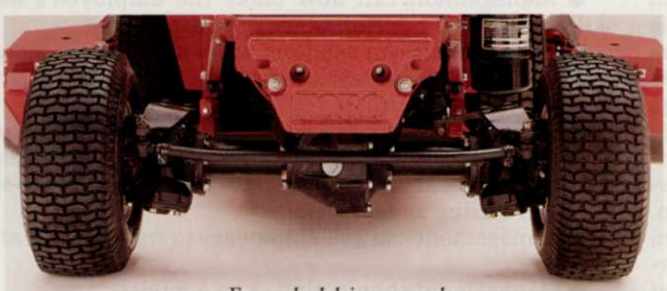
ng The Standard t Once In A While.

Now the rugged 322-D does double duty as a four-wheel drive model. Four-wheel drive gives you enhanced traction to tackle the steepest hills* and other conditions while minimizing turf tearing.



Four-wheel drive rear axle.

Toro's enhanced traction four-wheel drive is much more dependable than the two-wheel, differential lock type found on competitive machines. An on-demand overrunning clutch prevents against rear tire scuffing in turns, and a shift lever provides two- to four-wheel drive engagement or disengagement. Sixteen years of customer satisfaction have made the Groundsmaster 300 Series the standard against which other machines are measured. And now that we've raised the standard again by increasing mowing capacity and traction, you owe yourself a demonstration. Just call your local Toro distributor or contact Toro at the address below.

TORO

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The Toro Company, Commercial Marketing Services, 8111 Lyndale Ave. So., Minneapolis, MN 55420. *Refer to owner's manual for recommended maximum slope use.

TRAINING INSURANCE

Just because you've spent time and money training employees doesn't necessarily mean they've learned anything. Here's how to make sure they absorb new information to apply to their job.

by Lawrence Kokkelenberg, Ph.D.

Now that it is winter, training time is again upon us. Lawn and landscape companies all over America start training or send their employees to trade shows, conventions, conferences and seminars.

Employees attend these functions and when the spring begins, little—if anything—is different. In fact, the company may have done itself a disservice rather than the intended good that was hoped for.

Why has this happened? Because of a fundamental mistake: there is a difference between classroom learning and on-the-job performance.

When an employee returns from a training program, we assume the following:

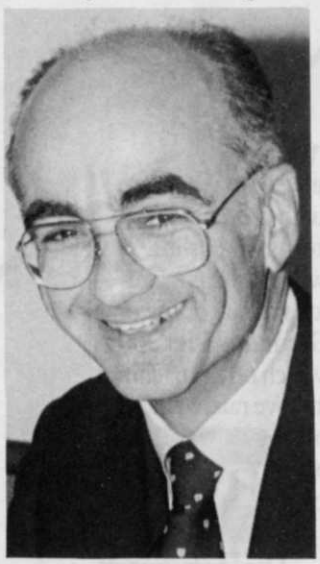
1. The training was successful (learning took place);
2. That learning will translate into on-the-job skills;
3. That management or the company has little additional responsibilities.

Let's explore these assumptions and find out how an organization can truly maximize its training dollars.

Lighting the bulb

In order for training to be successful, learning must take place. Learning implies understanding. Understanding is heavily dependent on the ability of the instructor to communicate and to some extent, the ability of the attendee to listen, focus and be involved.

Learning, unfortunately, does not always take place. In some cases, it takes place only minimally. To increase learning, the following actions are recommended:



Lawrence Kokkelenberg is president of the Center for Business Development, McHenry, Ill. He is a popular speaker at Professional Lawn Care Association of America conventions.

1. Inform employees who are to attend what you expect them to learn. Tell them why they were selected and what expectations you have for applying what they learn.

2. Inform employees that when the training program is completed there will be a follow-up session within one week. Ensure that this follow-up session takes place. Inform employees that during this follow-up, they will have to make a 15-minute (or longer) presentation on what they remember from the program. This should either get them to pay more attention during the training, or at least make them review their notes.

3. Have all employees who were present in the training complete a true/false test or an exam after the training. This will reinforce the training session and ensure their learning.

4. Prior to the training program, ask the trainees to draw up a list of items they would like to learn while in training. The training is more exciting and more relevant when it is learner-requested.

All these things *clearly* help the employee prepare for learning. The employee will be more attentive during the program, and you will have done your part. The rest is up to the instructor.

Once learning takes place, it must have relevance to the employee's job or it will quickly be forgotten. Immediate application allows for relevance and a critical and necessary opportunity to *practice* the new knowledge. An organization must do more than permit usage—it must foster, promote, and even demand that the employee's new knowledge be used on the job.

Using new skills

What will the employee do differently? What ideas does the employee have as a result of attending the program? How does the employee think they will implement any of these ideas?

Questions like these encourage the employee to use these skills *on the job.*

Management, in order to receive the greatest return on investment for training dollars, *must* support the employee's learning and practice. Support after the training program can come in many ways.

Once learning takes place, it must have relevance to the employee's job or it will quickly be forgotten.

- Management can now make the employee's new skills part of their performance appraisal.
- Management can send out six-week and six-month surveys asking employees if what they learned at training is still being used.
- Management can give additional responsibilities and authority to help these individuals use what they learned.
- Management can follow up employee learning to see if they are using any new skills.
- Management can ask employees to train or lead others.
- Management should always be a model.

Any company that merely sends its employees to a convention or training program, asks "how was it?," and then returns to business as usual would do better to keep the money in the bank. Any company that trains its employees and then promptly forgets about the training—

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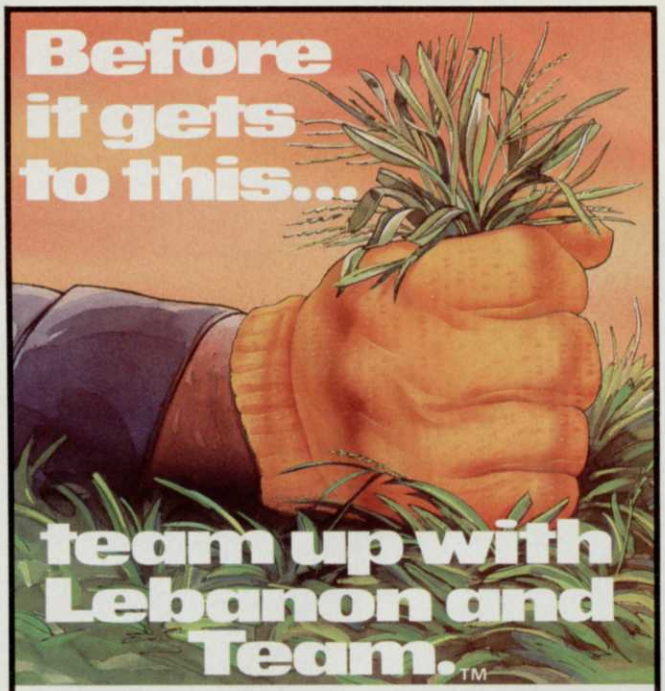

Lebanon's premium fertilizers with **Team**™ pre-emergence herbicide let you double-team your turf's toughest competition: annual bluegrass, smooth and hairy crabgrass, goosegrass, and green and yellow foxtail—as they germinate.

Lebanon's fertilizer/control products featuring **Team** have the added strength of two of the most effective defense-oriented pre-emergent herbicides today—benefin and trifluralin. And, the potent offensive power that **Lebanon's** premium fertilizers bring to strengthen northern and southern turfgrasses.

It's double trouble that lasts. **Team** won't leach out, even in heavy rainfall. Once it's activated, it forms a vapor zone to keep weeds from sprouting for several months.

For more information on which **Team** formulation is right for your turf conditions or on custom-blended options, contact your local **Lebanon** distributor or call our Greenline today at 1-800-233-0628 or 717-273-1685.

For a winning season against annual weeds, put our **Team** products to work for you.

There's a Lebanon fertilizer with Team formulation to meet every turf care need.

- Country Club 19-4-6 (3.2 WIN) with Team™ 1.155%
- Lebanon Pro 20-3-5 (4 SCU) with Team™ 1.155%
- Lebanon Pro 15-5-5 (4.5 SCU) with Team™ 1.155%
- Lebanon Pro 6-0-18 (All Chemical) with Team™ 1.155%
- Lebanon Pro 26-3-8 (5 SCU) with Team™ 1.54%

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Circle No. 140 on Reader Inquiry Card

never following it up, assuming the employee has learned and retained the information—would also do better to keep the money in the bank.

The purpose of training is to develop new skills in the participants. Training in the classroom usually does not develop new skills. Learning that takes place in the classroom is only part of the training process. In the classroom, learning takes place because of the content, the success of the instructor, the attention and listening skills of the participants. Learning demands comprehension.

Making sure

Skills are developed through practice, feedback, job relevance, reward and recognition. These factors take place on the job, after the classroom learning has been completed. It is managers' and supervisors' responsibilities to make sure

Are these guys learning anything? It may depend on whether or not their boss took the time to prepare them properly for the seminar.

that learnings from the classroom become translated into on-the-job new skills.

To make training profitable:

- Select your people carefully and with purpose;
- Inform them in advance of your requirement and expectations;
- Review their learnings immediately upon return;
- Expect and plan for on-the-job performance translation/improvement;
- Follow it up in one or more ways for six months.

If we all do our jobs, training *does* pay and *does* translate into on-the-job performance improvement, lower turnover, higher productivity and higher quality. Training takes classroom time and on-the-job practice. Training can be costly, but then again, consider the cost of ignorance, turnover and callbacks. **LM**

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More people find more reasons to get behind Ransomes Bobcat than any other mid-size mowers. Because we never stop getting great ideas for improving them. Like our new ultra-durable, double-wide belt for truly uninterrupted mowing. Or our exclusive quick-lock caster clips for dependable wheel security. For landscaping and grounds-keeping, remember; no one puts more new features on a wider selection of commercial mowers (32″ to 54″ cutting widths) than Ransomes. The best selling mid-size mowers in the world.

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Introducing new Pace®. The first Pythium fungicide so advanced it even cleans up after itself.

Each carton contains two water-soluble packets. The exact amount needed to treat the average size putting green.

Simply drop the two premeasured packets into a half-filled spray tank, then discard the carton as you would any paper container.

Within two minutes, the packets are thoroughly dissolved. And all that's left for you to do is fill the rest of the tank and spray.

It's that simple. And that safe. Because all you touch is the outer carton itself. Not the chemical.

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Pace controls Pythium both on contact and systemically.

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The new Pace water-soluble packaging dissolves thoroughly within just 2 minutes.

seen in a single fungicide. Because a single fungicide it's not.

What it is, is the first ever pre-mixed, pre-measured, and pre-tested formulation of a contact *and* a systemic.

In trials at major universities, the synergistic, dual action of this combination proved more effective than any other Pythium fungicide currently on the market.

So if you've been waiting for a fungicide that not only takes care of Pythium, but also things like employee exposure and container disposal, it's finally here.

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THE TRADITION CONTINUES...

Ordinances protecting trees date back 300 years in Newark, N.J. Under tree pioneer Carl Bannwart, more than 60,000 trees were planted in the city. Today that tradition lives on.

by Frank J. Sudol and Alvin L. Zach

One of the major areas of concern to residents of any municipality is the maintenance of street trees. In Newark, N.J., tree maintenance was once the largest area of citizen complaint. Over the past four years, however, the city has set a new standard for establishing a comprehensive urban tree management and implementation program.

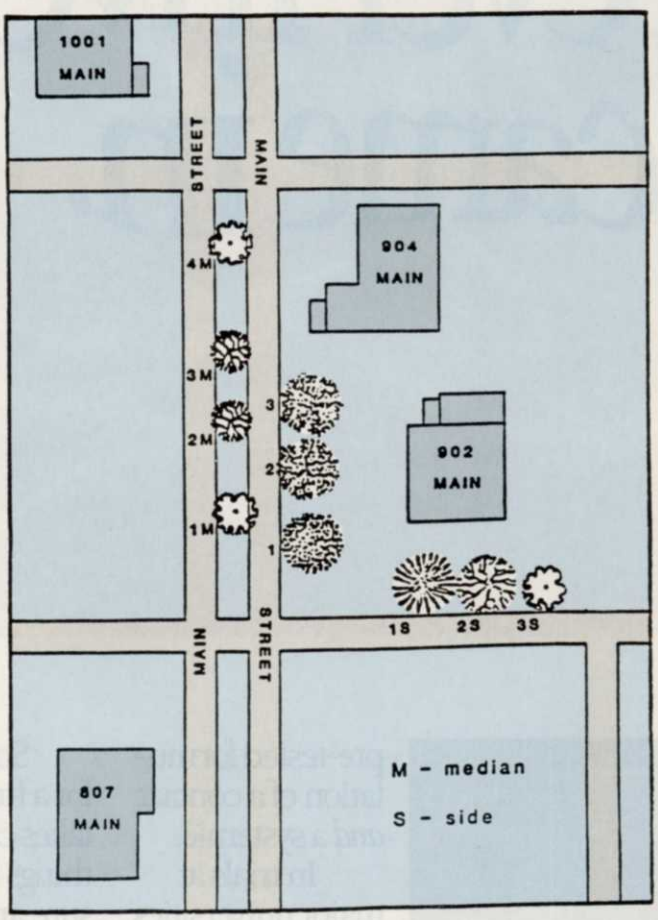
The city today continues the tradition set by Carl Bannwart, its first urban forester. During the last three years, more than 20,000 trees have been pruned, all dead trees and all stumps removed, and more than 3000 new trees planted.

The tree management program was vigorously reinstituted late in 1984 when the city council contracted to provide a complete inventory of all street trees, park trees and to recommend planting sites.

Under the terms of the contract, the data collected was computerized and a comprehensive plan was developed for the city to use in caring for and replacing its trees.

The inventory included trees on public streets and in city parks. It contains information on location, number, size, species, condition, insect infestation, disease and other problems of the trees.

In addition, the location of each tree, by street address, block and lot, census tract and ward, as well as its genus and species, size (diameter at breast height), height to the top of its crown, maintenance needs and location in relation to overhead wires was noted.



Newark's tree numbering system using an "S" to note side lot trees and "M" for roads with tree medians.

Future tree planting sites were identified for the optimum planting of new trees, detailing the best species for particular areas.

The contract provided $46,125 for the inventory and $6,170 to train Newark employees to use the system.

The remaining $3,470 was used to develop a "work data program" that allows the department to record work as it is done on trees to continuously update the initial inventory. This has provided a complete data base on Newark's trees. It also allows the city to compare costs between contractors, various tree species, tree locations and total expenditures on each tree care function such as removal and pruning. This work data program was recently revised by the city's computer consultant to make it more functional and to better meet the city forester's needs.

As data is accumulated, it is possible to evaluate the comparative cost of maintaining an American sycamore to that of a maple. Then it can be decided when it is no longer economically viable to maintain a mature tree. In addition, it can be determined the cost ratio for numerous smaller trees compared to the cost of a large over-mature tree.

Inventory updating is performed by the city's forester in order to sustain the value of the initial inventory.

While the trees in Newark County parks were not included in the city's inventory, it's important to note their significance. Newark is known as "Cherryblossomland" for the magnificent display of more than 3,000 cherryblossom trees in the 360-acre Branch Brook Park. It is one of the most famous in the world, exceeding even the Tidal Basin display in Washington, D.C.

continued on page 60

Frank J. Sudol is chief of planning and project execution for the City of Newark. Alvin L. Zach is director of the city's Department of Engineering.

IF YOU DON'T BUY A SCAG HYDRO THIS YEAR, HERE'S WHAT YOU'LL BE MISSING.

Scag's new hydrostatic riders are engineered and built to perform better and last longer. No other hydrostatic rider gives you the high-performance features you get on a Scag rider.

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TABLE 1.
PLANTING SITE IDENTIFICATION

All planting sites for locations where trees should be planted were classified as marginal, small, medium or large and whether sidewalk or asphalt excavation is needed before tree planting. The following are minimum dimensions for planting sites:

Computer Code	Site Size	Sidewalk Excavation Required	Minimum Distance to any Tree	Minimum Distance to Building
MGPS	Marginal	No	30 feet	6 feet
SPS	Small	No	30 feet	10 feet
MPS	Medium	No	40 feet	15 feet
LPS	Large	No	50 feet	20 feet
MGPS/EX	Marginal	Yes	30 feet	6 feet
SPS/EX	Small	Yes	30 feet	10 feet
MPS/EX	Medium	Yes	40 feet	15 feet
LPS/EX	Large	Yes	50 feet	20 feet

The following are additional specifications used to determine the presence of planting sites:

* All planting sites were at least 35 feet away from the intersection of curbs.
* All planting sites were at least 10 feet away from fire hydrants.
* All planting sites were located at least five feet away from any visible or identifiable underground utilities, signs, light poles, driveways or other permanent structures.
* The largest possible size classification was recorded for each planting site.

Trees receiving a rating of "safety trim" are recommended for trimming to remove hazardous deadwood and/or broken branches.

Defining work

By visual inspection, work needs and priorities were determined. The maintenance need was assigned based on a thorough visual examination of the tree by trained and experienced tree care experts. Each tree needing work was put into one of five categories: tree removals, safety trim, routine prune, safety clearance trim and prune to shape.

This data provided a basis for prioritizing trimming and removal needs. It assisted in developing accurate trimming forecasts. Definition of the maintenance groups are:

1. Tree removals. Trees designated as "removal" had one or several defects that could not be cost-effectively or practically corrected. Such defects included severe trunk decay and severely decayed or weakened V-crotches that could not be effectively called or gauged. The majority of the trees in this category had a major percentage of their crown dead and consequently were potential safety hazards.

Smaller trees (0 to 6 inches diameter breast height) listed as "removals" are usually those that have died as a result of transplant shock, vandalism, poor cultural practices or other causes.

2. Safety trim. Trees receiving a rating of "safety trim" are recommended for trimming to remove hazardous deadwood and/or broken branches. Most of the trees in this category pose a potential safety hazard which could result in bodily injury or property damage. These were further classified into two priority categories based on the potential for injury or liability:

a. Immediate priority: any tree with broken or hanging limbs, hazardous deadwood and dead, dying or diseased limbs or leaders greater than four inches in diameter that are in immediate danger of falling.

b. High priority: any tree with dead, dying, diseased or weakened branches between two and four inches in diameter that are a potential safety hazard.

3. Routine prune. Trees receiving this rating often have problems that have the potential of becoming safety hazards if not corrected in the near future. This includes trees with deadwood which presently pose little threat of bodily injury or property damage, correctible structural problems and/or growth patterns that would eventually obstruct traffic or interfere with utility wires or buildings. Routine prune maintenance needs were classified into two priority categories:

The choice is yours. Whether your customers need season-long preemergence weed control by itself or on fertilizer from leading formulators, Team fits.

Either way, you can control crabgrass and goosegrass season-long with just one application. Or even a split application, if need be, to better fit your program.

Team granular also fits your high standards of annual grass weed control. University tests show it's outstanding. Team gets to the ground and stays put to form a zone of protection that keeps weeds out all season long.

And Team does all this without hurting your turf, including sensitive bentgrass.

So spread it straight in granular form. Or spread it on fertilizer available from leading formulators. Team fits your program. See your Elanco representative. Or call toll-free: **1-800-352-6776.**

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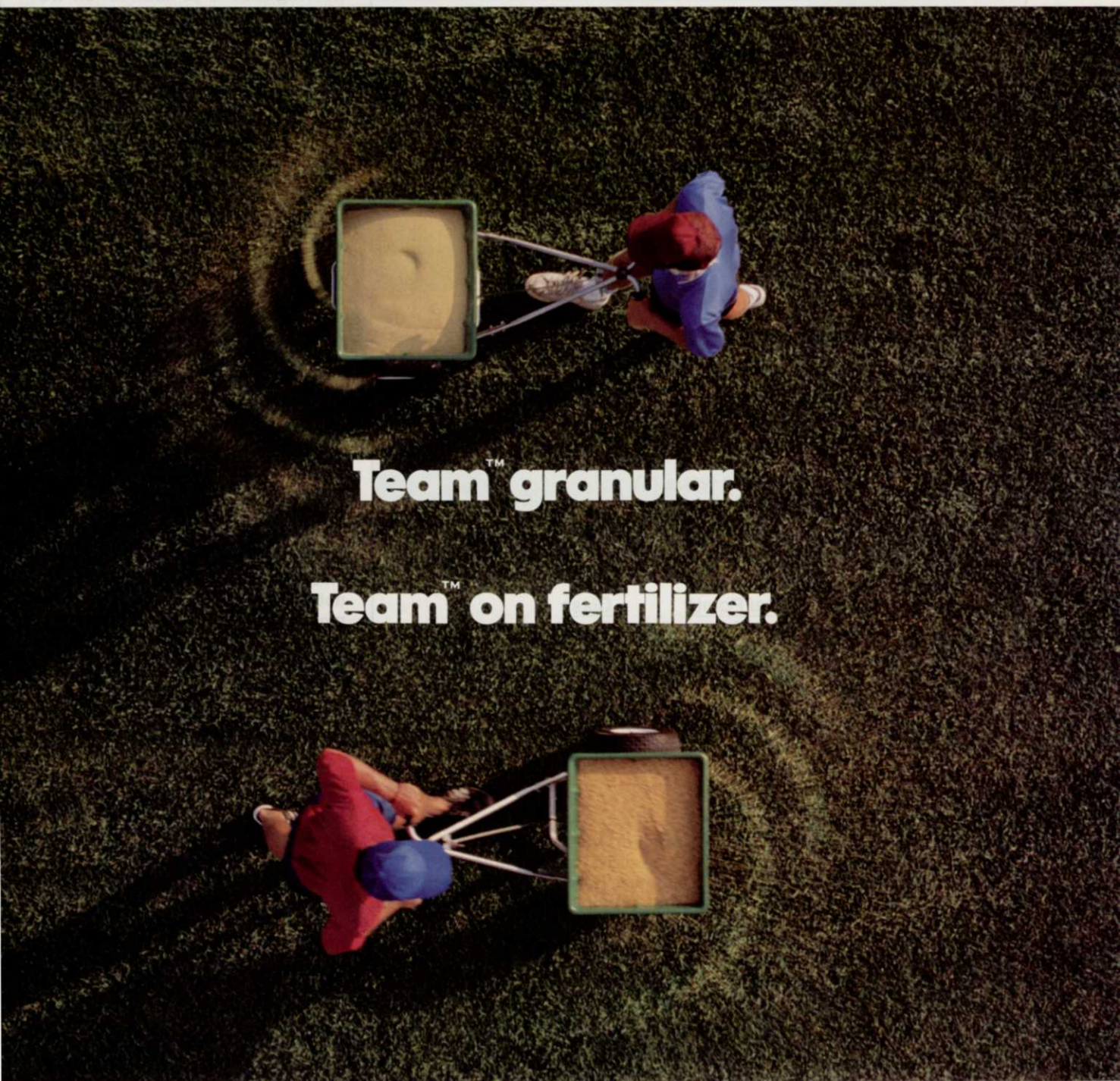

TABLE 2

CONDITION CLASS RATING SYSTEM

Condition class uses the following rating scheme:

TRUNK CONDITION:	**Sound & solid (5)** **Sectons of bark missing (3)** **Extensive decay & hollow (1)**
GROWTH RATE:	**More than 6-inch twig elongation (3)** **2- to 6-inch twig elongation (2)** **Less than 2-inch twig elongation (1)**
STRUCTURE:	**Sound (5)** **One major or several minor limbs dead (3)** **Two or more major limbs dead (1)**
INSECT & DISEASES:	**No pests present (3)** **One pest present (2)** **Two or more pests present (1)**
CROWN DEVELOPMENT:	**Full & balanced (5)** **Full but unbalanced (3)** **Unbalanced and lacking a full crown (1)**
LIFE EXPECTANCY:	**Over 30 years (5)** **15 to 20 years (3)** **Less than five years (1)**

Total Points	Class
23 - 26	Excellent
19 - 22	Very good
14 - 18	Good
10 - 13	Fair
6 - 9	Poor
0	Dead

a. *High priority*: all trees with dead, dying or diseased wood between one and two inches in diameter and/or requiring removal of interefering or weak branches which need attention in the near future, but pose no current threat of bodily injury or property damage.

b. *Low priority*: all trees with dead, dying or diseased or other incipient problems that are judged not to need immediate maintenance attention and pose little threat of becoming serious problems until their next trim cycle.

4. Safety clearance trim. This category represents trimming needed to clear areas that obstruct pedestrian or vehicular traffic. All trees obstructing the view of traffic control signs were noted in this category.

5. Prune to shape. Indicates the need to prune small trees correctly or eliminate weak, interfering or objectionable branches in order to minimize future maintenance needs. This applies to trees that can be worked with a pole pruner by a person standing on the ground.

6. Clearance. All trees not cleared to a height of 13 feet 6 inches over roads and 8 feet over sidewalks were included in this category.

Accomplishments

As a result of the inventory and cost comparison with city-provided services, the city's Department of Engineering moved to contract all tree maintenance at substantial cost savings to the city. Without the inventory, much of the work would not have been performed. The organized record-keeping offered by the inventory has aided the city dramatically. Now, only one individual is needed to maintain the system and contract out all necessary work as computerized scheduling necessitates. The computerized inventory also has provided the city with better accountability on how it spends tree management funds.

In 1985 and 1986, more than 2,600 trees were removed at an approximate cost to the city of $350,000.

The Department of Engineering planted approximately 1000 street trees in 1986. Sites were determined by resident request and city prioritization. An emphasis for planting new trees was placed around urban garden sites, residential communities and areas where the likelihood of vandalism is less. The apporixmate cost for the 1987 planting of another 1,000 trees was $350,000.

The DES street tree inventory did not inventory tree stumps to be removed within city boundaries. The Department of Engineering, however, identified approximately 100 stumps from city resident requests, other requests and departmental field inspections. All stumps were removed with an approximate cost of $20,000.

By the end of 1987, two-thirds of Newark's tree population had been trimmed since 1985. The entire tree population was projected to be trimmed within another two years, with an estimated annual cost of $300,000.

Emergency tree work for fallen limbs, branches and trunks is another service the Department of Engineering now has under contract. The two emergency response times used are the one-hour notice and 72-hour notice. The estimated cost to the city is approximately $100,000. **LM**

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The Only One-Stop Source For Your Underground Construction Equipment Needs...

Ditch Witch®

Your Ditch Witch Dealer

When people in the construction business hear the name Ditch Witch, they think trenchers and vibratory plows. And for good reason, because Ditch Witch is the leader in these fields. But you might be surprised at some of the *other* products offered by Ditch Witch. They are different than trenchers and plows, yet they fit in exactly with many of your specialized underground construction jobs.

Perma-Soil stabilizer reduces subsidence for a wide variety of repairs.

Perma-Soil® Stabilizer

When your work involves restoration of excavations, street repairs, fixing potholes or setting utility poles, you can save time and money when you use Perma-Soil stabilizer. It dries, strengthens and bonds soil into usable backfill. It also minimizes settling of repaired sites. Perma-Soil stabilizer is effective in soils with a seven percent or greater moisture content.

The 1025SK backhoe loader is compact, versatile and highly productive.

1025SK Sidekick® Backhoe/Loader

This is the machine that does the jobs others can't do, because it's compact enough to work in places where others can't go. The 1025SK is big on performance. It features a 10-foot depth backhoe on one end and a self-leveling, 2,500-pound operating capacity loader on the other. For maneuverability, the 1025SK has four-wheel steering and four-wheel drive.

Rammers, Plate Compactor

Pound for pound, Ditch Witch compaction equipment is the best you can buy for trenching restoration or street repair. The DR-50 Rammer, the DR-65 Rammer and the DP-190 Plate Compactor are totally self-contained.

Ditch Witch compaction equipment helps complete the job.

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Whether the bore is under a sidewalk or a freeway, Ditch Witch has the boring and earth auger equipment to do it. Ditch Witch boring units deliver the dependable power and precise control needed for horizontal boring or casing push jobs. All three hydraulically-powered models are easy to operate and cool-running. Choose from several cutter heads.

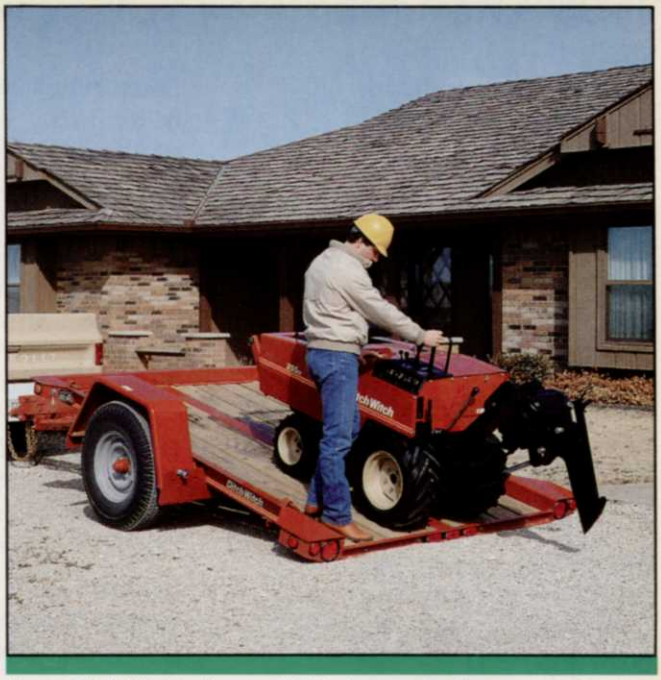
Ditch Witch boring equipment is designed for better, cooler, more precise horizontal boring.

Pierce Airrow® Pneumatic Piercing Tool

Install pipe, cable or wire under streets or paved surfaces where other methods are cost prohibitive, with the Pierce Airrow pneumatic piercing tool. Simplicity of design makes it dependable, because there is only one moving part. There are no welds in the one-piece tube. The earth compressing

The versatile Pierce Airrow tool installs pipe, cable or wire under obstacles where other methods are cost prohibitive.

nosepieces are machined from heat-treated steel bar stock. The Pierce Airrow tool is fast, easy to use and reversible. Choose from five models that range from 2 inches up to 5½ inches in diameter.



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POST-ERIZING LANDSCAPES

You can provide your landscape clients with an additional service if you've got someone on staff who can design and/or build attractive wooden fences. They not only add beauty to the home, but value too.

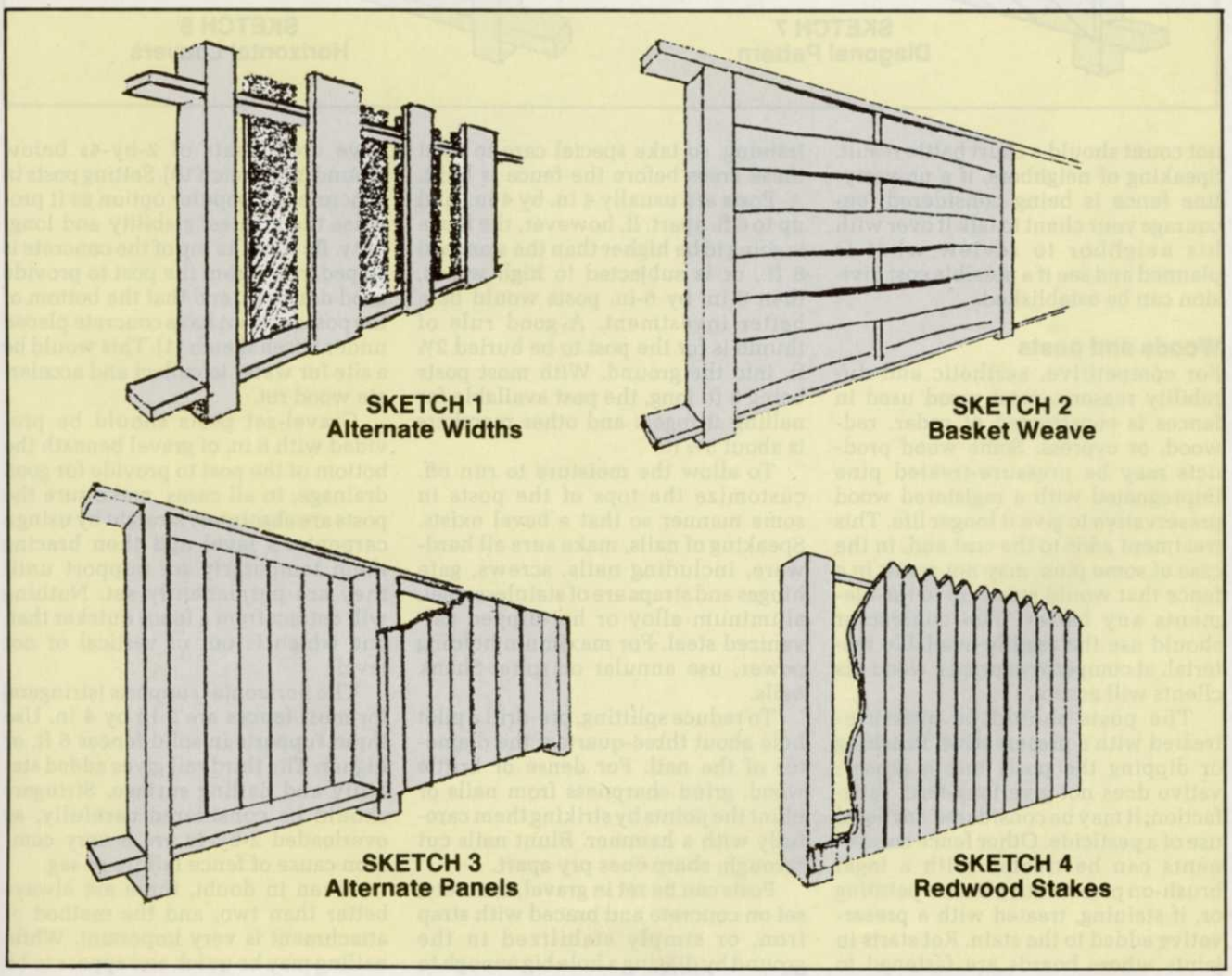
by Ronald C. Smith, Ph.D.

Early settlers found more wood than they'd ever seen when they arrived on the American continent. Coming from timber-short Europe, they used wood for virtually every building purpose imaginable: ships, homes, barns, schoolhouses, bridges, factories and fences.

The poet Robert Frost wrote, "Good fences make good neighbors." Abraham Lincoln got his start supplying fence rails, and Tom Sawyer conned his friends into painting his Aunt Polly's fence. Today wood fences are increasingly popular with the homeowner to mark his boundaries, protect a swimming pool or provide privacy.

A well-designed and installed wood fence becomes a positive landscape asset, providing an attractive picture frame for a home or property. Fences come in all sizes and heights, and most require only basic carpentry skills to construct.

However, before installing a wooden fence, check with the local building code office; there may be height and/or construction limitations. If the fence is going to be put along a property line, don't guess! It is worth the investment of a few dollars to get an accurate survey of the property: opinions between neighbors do

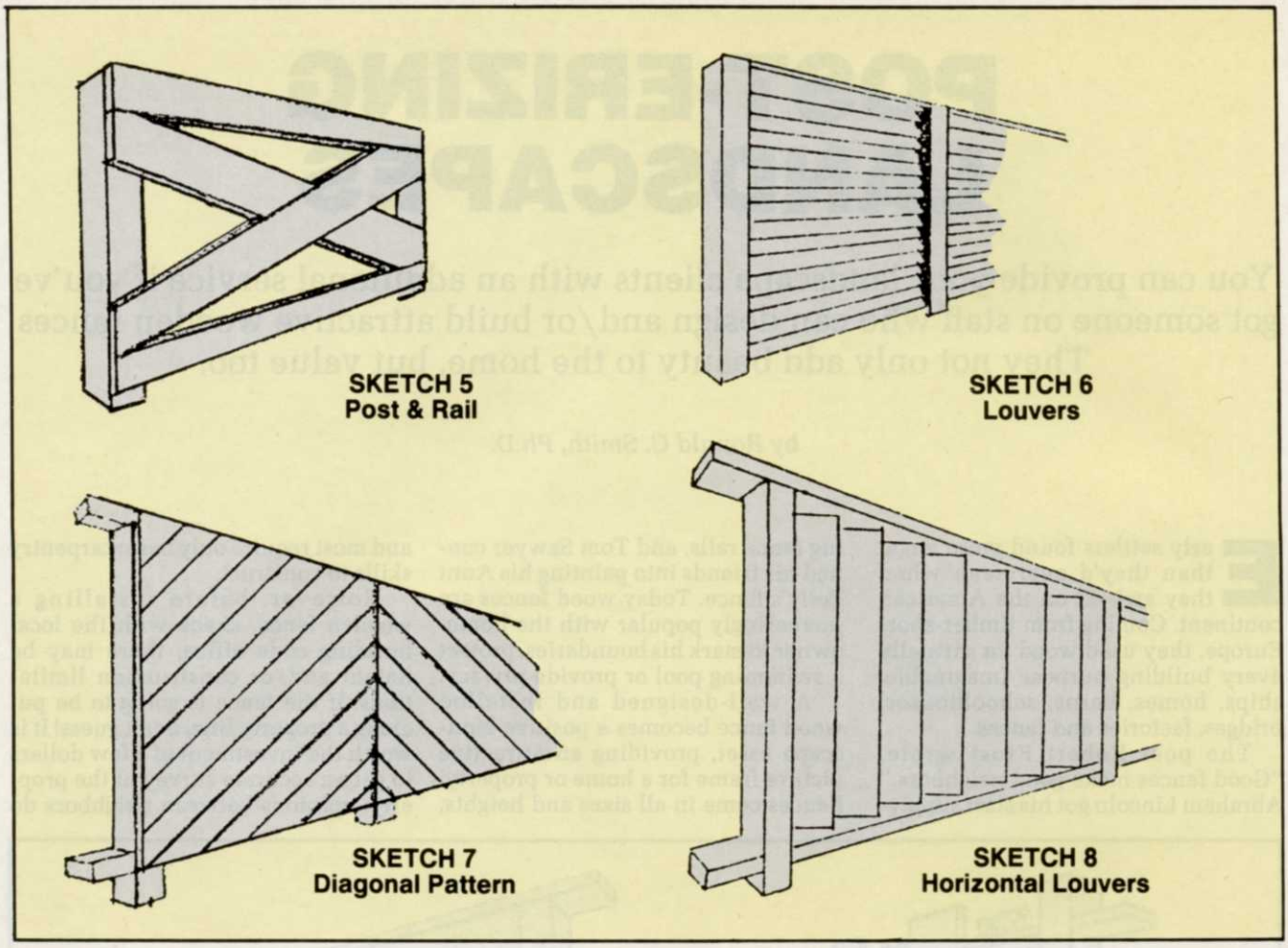


SKETCH 1
Alternate Widths

SKETCH 2
Basket Weave

SKETCH 3
Alternate Panels

SKETCH 4
Redwood Stakes



not count should a court battle result. Speaking of neighbors, if a property-line fence is being considered, encourage your client to talk it over with his neighbor to review what is planned and see if a possible cost division can be established.

Woods and posts

For competitive, aesthetic and durability reasons, most wood used in fences is constructed of cedar, redwood, or cypress. Some wood products may be pressure-treated pine impregnated with a registered wood preservative to give it longer life. This treatment adds to the cost and, in the case of some pine, may not result in a fence that would stand up to the elements any better. The contractor should use the readily-available material, at competitive prices; wood his clients will accept.

The posts should be pressure-treated with a preservative. Brushing or dipping the posts into a preservative does not give long-term satisfaction; it may be considered an illegal use of a pesticide. Other fence components can be treated with a legal brush-on preservative before painting or, if staining, treated with a preservative added to the stain. Rot starts in joints where boards are fastened to framing, so take special care to treat these areas before the fence is built.

Posts are usually 4 in. by 4 in., and up to 8 ft. apart. If, however, the fence is going to be higher than the standard 6 ft., or is subjected to high winds, then 6-in. by 6-in. posts would be a better investment. A good rule of thumb is for the post to be buried 2½ ft. into the ground. With most posts being 8 ft. long, the post available for nailing stringers and other members is about 5½ ft.

To allow the moisture to run off, customize the tops of the posts in some manner so that a bevel exists. Speaking of nails, make sure all hardware, including nails, screws, gate hinges and straps are of stainless steel, aluminum alloy or hot-dipped galvanized steel. For maximum holding power, use annular or spiral-Shank nails.

To reduce splitting, pre-drill a pilot hole about three-quarters the diameter of the nail. For dense or brittle wood, grind sharpness from nails or blunt the points by striking them carefully with a hammer. Blunt nails cut through; sharp ones pry apart.

Posts can be set in gravel, concrete, set on concrete and braced with strap iron, or simply stabilized in the ground by digging a hole big enough to have crosscleats of 2-by-4s below ground (see sketch 10). Setting posts in concrete is a popular option as it provides the greatest stability and longivity. Be sure the top of the concrete is sloped away from the post to provide good drainage, and that the bottom of the post does not have concrete placed under it (see sketch 11). This would be a site for water to collect and accelerate wood rot.

Gravel-set posts should be provided with 6 in. of gravel beneath the bottom of the post to provide for good drainage. In all cases, make sure the posts are absolutely straight by using a carpenter's level and then bracing them temporarly for support until they are permanently set. Nothing will detract from a fence quicker than one which is out of vertical or not level.

The horizontal supports (stringers) for most fences are 2 in by 4 in. Use three supports in solid fences 6 ft. or higher. The third rail gives added stability and nailing surface. Stringers should be considered carefully, as overloaded 2-by-4s are a very common cause of fence failure or sag.

When in doubt, three are always better than two, and the method of attachment is very important. While nailing may be quick and appear to be

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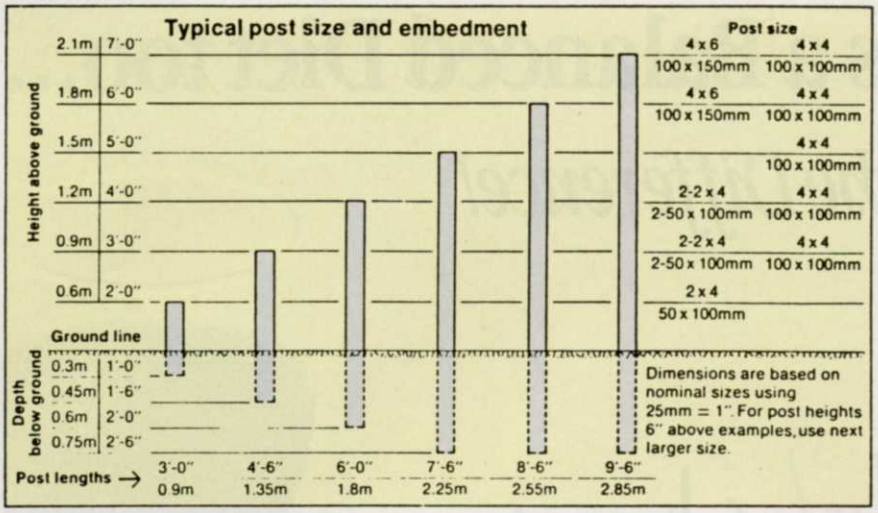
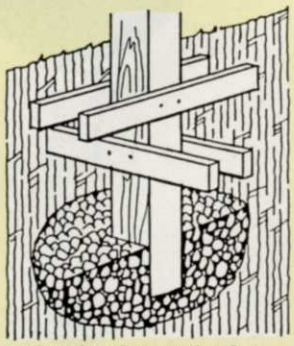
SKETCH 9

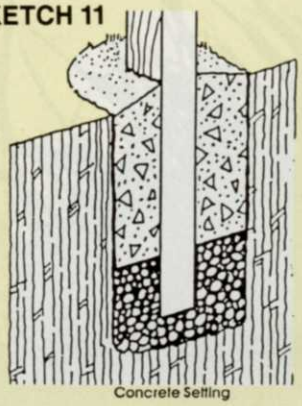


SKETCH 10



Cross Cleat Setting for Gate Posts

SKETCH 11



Concrete Setting

satisfactory, in time the nails may loosen or pull out as they are exposed to the weather.

Use either a counter-sunk carriage bolt for attachment or a steel angle bracket to attach to the posts. If nailing is still preferred, then use the annular or spiral-shaped ones for maximum holding power.

Facing detail

Fences have many purposes, but most are installed for privacy or some degree of security in a hopefully aesthetic manner. One of the best fence styles to meet these criteria is the board-on-board or alternate board style. In addition to aesthetic features, this style allows the air to pass through, spreading out snow drifts for faster melting. The real bonus of this fence is that it looks great from both sides.

A solid, stockade-type fence may offer a little more privacy and security, but it provides the greatest wind resistance, causes deep snow drifts to form, looks good from only one side and is usually quickest to deteriorate. Additionally, heat zones can build up on south or west exposures which can kill some plants or at least accelerate plant desiccation.

Let your imagination run free in selecting a design—virtually anything can be done, which is a major advantage of working with wood (see sketch 4).

The gate

Since gates will be getting the most wear and tear, their construction should be especially sturdy. Here, the posts should be 6-by-6 set in concrete and assembled with screws rather than nails, for greater strength. The minimum width for gates is 3 ft., with 4 ft. being preferred. The larger opening allows for the easy movement of small garden and constrution equipment.

Like fence panels, gates are usually a matter of design preference.

Every successful gate has good frame construction and good hinges used to hang the gate. There are any number of hinges available, but the hinge must be matched to the weight of the gate. As a rule, gates should be supported by at least 3 hinges, particularly if there is a chance that any excess load will be put on the gate, soft metal hinges should be avoided. Small children are one of the most common excess loads. Kingpin and flat hinges made of heavy duty, hot dipped galvanized steel are commonly used and re-bolted to the gate, rather than nailed.

Finishing it off

Many people prefer to allow their wood fences to weather naturally. Most pressure-treated wood will weather to a pleasing gray color. Should the wood be painted or stained, be sure it's dry before any type of finish is applied.

If a paint is to be applied, be sure to cover with a good wood primer first, then paint with a good grade of outdoor house paint, either oil or latex based. Once done, repainting will be needed every 3 to 5 years depending on exposure and weather conditions.

If staining is preferred, there are three basic types:

- Penetrating stain - These are usually oil-based and are transparent, highlighting the wood grain in the fence. They also mellow with age if a protecting top coat is not applied.
- Latex stain - These are water-based, making clean-up much easier. They are semi-transparent and will mask some of the wood grain. Latex stains do not penetrate wood as deeply as a penetrating stain, and they too, will mellow with age if no protective coating is applied.
- Varnish-based stains - These stains combine a penetrating stain with varnish for protection; they are available in both gloss and semi-gloss finish.

Wood fences open a vista of opportunities for landscape ideas. Most truely do create a microclimate for growing plants that might have been too tender for the location. In some cases, fences can provide protection from the extremes of sun or wind allowing for the installation of small fountains or reflecting pools. **LM**

Ronald C. Smith, Ph.D., is an extension horticulturist with North Dakota State University, Fargo, N.D. He is also on the board of the North Central Turfgrass Association.

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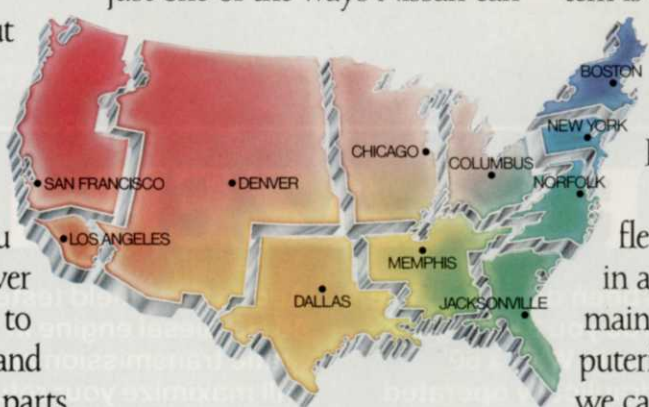

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PARADISE UNDER GLASS

The Opryland Hotel complex is a greenhouse away from home, with enough plant varieties to rival Heinz.

by Terry McIver, associate editor

The lush surroundings of the Conservatory feature 15 different palm varieties.

How's this for a service contract: daily care of approximately 18,000 plants—some very rare and temperamental—covering four acres, in a controlled environment. To be tended amidst annual tourist traffic of about 500,000 people.

Such a regimen does exist, but you won't find it on any street. It belongs to the landscaping crew of the Opryland Hotel in Nashville, Tenn. The crew is charged with the care and feeding of the plant life in the hotel's two massive indoor gardens, The Conservatory and The Cascades.

The two lush garden environments were installed as part of the hotel's Phase II and Phase III expansion projects, by Earl Swensson & Associates, architects for the entire Opryland Hotel complex. The Conservatory phase was completed in 1983; the Cascades project was finalized in 1988.

The Conservatory was designed by a team of architectural experts inspired by conservatories in England, Scotland, Italy and Canada.

"All of your senses are affected here," says Swensson. "There are places to sit quietly and think. There are paths to walk, and there are places to eat and drink.

"The magic is that it's all indoors. For someone attending a business meeting or a pleasure traveller, the Conservatory is more than a figurative breath of fresh air."

Landscape manager and horticulturist Hollis Malone spent months selecting The Conservatory's 10,000 tropical ornamental plants which represent 37 families and more than 215 varieties. It took Malone, assistant landscape manager Don Voorhees and a crew of 10 many months to finalize the landscape.

The Conservatory is meant to recall the lush solitude of a Victorian garden. It includes six kinds of ficus trees, four kinds of banana trees, 15 types of palms and a sampling of orange trees.

"We went to Florida and bought most of the Conservatory plants a year in advance," says Malone. "In some cases we actually took cuttings and had a Florida nursery grow the plants especially for us."

Temperature in the Conservatory is maintained at 71 degrees with humidity of 50 percent. A retractable window shade controls the amount of light that streams in through the 110-foot-high roof.

Soil for the Conservatory is a mix of 60 percent pinebark fines, 20 percent peat and 20 percent sand. "We tried to balance pH during mixing process by adding lime nutirents," says Voorhees, "now we find the soil is settling. We've started a regular process of adding soil as needed to raise the plants. In some areas, soil depth reaches three feet."

Cascading beauty

The Cascades is a a two-acre water-oriented interior space that features 8,200 tropical and ornamental plants of 449 different species, and a lake that covers 12,500 square feet.

The challenge to Malone when selecting plants for the Cascades was to complement the Conservatory while highlighting the Cascade's own features, and to install plants that were as well developed as those in the Conservatory.

"We went a step further than we did with the Conservatory design by selecting a larger variety of flowering bushes and trees as well as a number of rate plants," says Malone.

Traffic in the Cascades is compounded by a restaurant and gazebo-style bar.

Plant varieties in the Cascades collection range from a 40-foot high Alexandria palm tree to six-foot-tall ginger bushes and jasminum vines.

The Cascades is truly a landscaping wonder. Light streams in through a glass skylight, and water flows down and around man-made yet realistic rocks and mountains. Nighttime entertainment features the laser light-accompanied "Dancing Waters." Fountains erupt to the rhythms of recorded music or melodies plucked by the house harpist.

A day's work

While the amount of care required by the complex would indeed make any landscape managers take leave of his senses, Malone and company are supported by automatic watering systems which can also be used to pump nutrients and fertilizers to roots.

Peters fertilizers are used for the two gardens, along with an Aqua-Gro wetting agent. When necessary, Subdue and Banrot fungicides are applied.

"We've had great success with the Peters product," says Malone. "We use their 248-16 tropical foliage food with a 3-2-1 ratio.

"Dispensing fertilizers and fungicides through the grid system prevents spotting, and is much neater and safer," says Malone. But he admits watering is his most important concern. "Primarily because we have both sun and shade. The sunnier areas need water every two or three days, while a shaded area needs less."

Most watering in the Cascades is done by a drip irrigation grid system. Emitters are placed every square foot in 18 watering stations, and dispense one gallon of well water per hour according to specific schedules. Using well water results in a considerable savings for the hotel, considering an average weekly rate of 20,000 gallons.

To avoid traffic jams caused by massive crowds that descend upon the complex, most spot watering is done in early morning.

Hollis Malone, left, and Don Voorhees lead the Opryland crew.

Daily care includes check-ups of plant material, leaf cleaning, and spot checks for overly dry soil.

One problem that the larger plants have since outgrown is that of weaker root systems. "Being indoors," Malone explains, "the plants don't have to contend with wind, which results in weaker root systems, and, at the outset, some falling plants." Malone will install supports to secure the weaker plants, unless the supports are aesthetically unattractive.

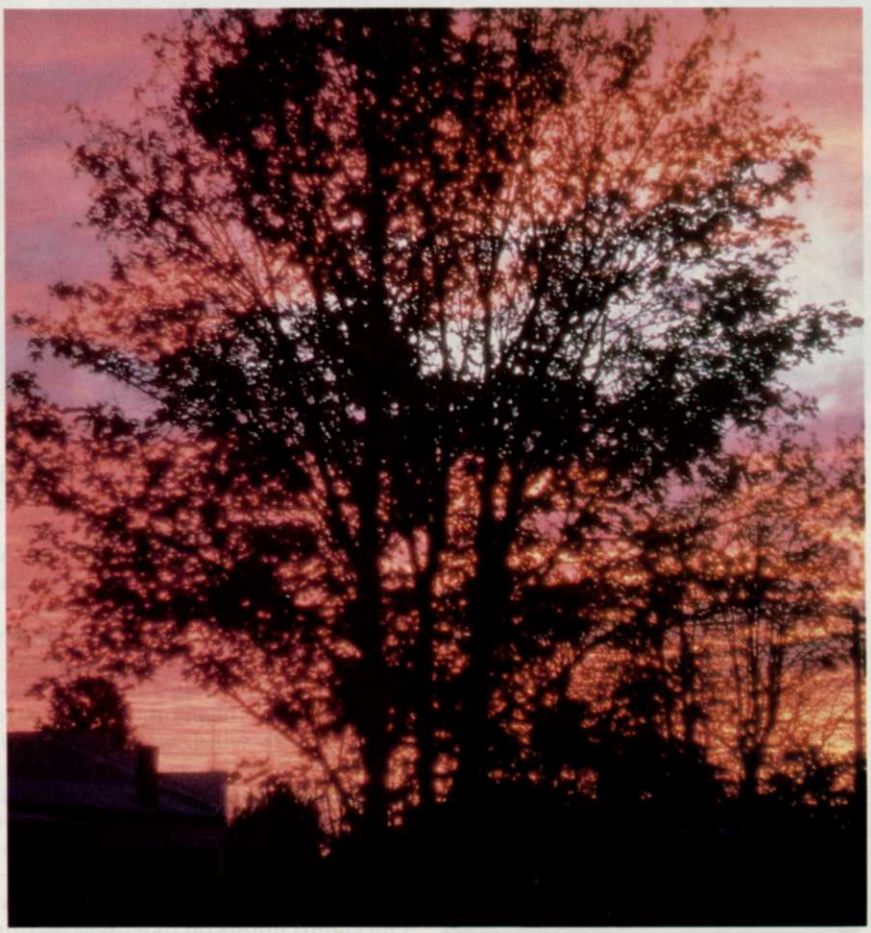
Disease and pest control at Opryland centers on root diseases due to overwatering. "Some are brought in alredy carrying a disease such as pythium or rhyzoctonia," says Malone, "but insect control is our biggest challenge."

An insect problem is to be expected, with thousands of people coming in from the great outdoors carrying a bug or two on their clothing. "Spider mites are most common, and we see an occasional white fly or aphid," Malone says. "If we see a problem, we spray the infected plant, rather than expose a wider area to chemical control. But if we have a troublesome plant, we'd rather throw it away rather than risk too much treatment." **LM**

WHERE THE TREES COME FROM

The introduction of several biological concepts have allowed researchers to fine tune the art of tree propagation.

by Douglas Chapman, Dow Gardens



The number of shade trees successfully propagated by cuttage or tissue culture will continue to grow.

By providing interest and color, trees, shrubs and bedding plants are often the difference between an average and an exciting golf course. To better develop a course, a superintendent should be aware of new biological concepts that affect the quality, amount and type of trees, shrubs and herbaceous plants that can be grown on the course.

One current technology is propagation of trees by cuttage and/or tissue culture.

Shade and ornamental plant production has been moving more toward unique cultivars, or clonal plants, for specific goals. These goals should include disease resistance, environmental tolerance or crown uniformity.

Early problems

Many trees were produced by budding and grafting during the 1960s and 1970s. By the mid-'70s however, symptoms of incompatibility were appearing with the descendants of many red maples breaking off at the rootstock union. This incompatibility even occurred on trees with a diameter of up to 2 to 4 inches. Further, many trees were suckering excessively, increasing maintenance costs, and producing trees that were not remaining vigorous or healthy over the long run. In short, new propagation techniques had to be found.

TREES PROPAGATED BY CUTTINGS

Acer buergerianum (1)	late June	*A. saccharum*		*M.* 'Profusion' (6)	late June - mid July
A. campestre (4)	June - July	*subspecies Nigra* (5)	mid June - mid July	*M.* 'Red Jewel' (6)	mid June - mid July
A. carpinifolium (16)	late June	*A. tegmentosum* (2)	July	*M. sargentii* (6)	late June
A. ginnala (4)	mid June	*Aesculus*		*M.* 'Selkirk' (3)	May - June
A. griseum (12)	late June	*hippocastanum* (5)	late May - mid June	*M.* 'Snowdrift' (5)	mid June - July
A. palmatum (12)	June	*cornus florida* (1)	mid June - July	*Ostrya virginiana* (6)	late June - mid July
A. platanoides (5)	mid June - mid July	*Malus* 'Donald Wyman' (6)	mid June - mid July	*Quercus palustris* (5)	mid - late July
A. rubrum (4)	mid June - mid July	*M. hupehensis* (3)	mid May - June	*Tilia cordata*	
A. saccharum (19)	June	*M.* 'Mary Potter' (5)	mid June - July	'Greenspire' (8)	mid June - early July

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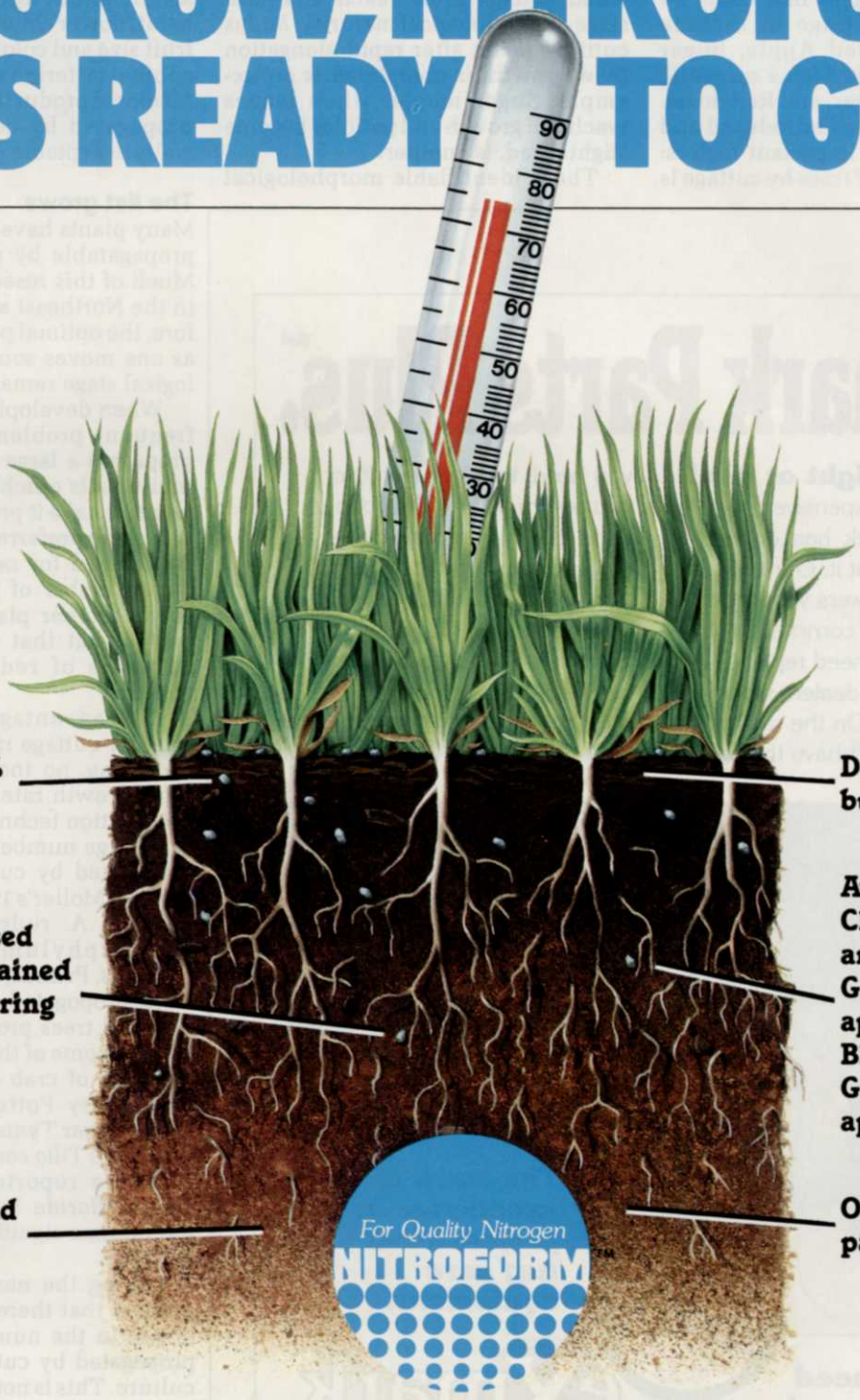

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TREES *from page 76*

Researchers at Rutgers first reported propagation of Norway maples, red maples and *Acer ginnala* by cuttage. In 1981 this list was expanded to include crab apple, which was shown to be propagable by cuttage.

By 1984 researchers had extended the list of crab apples that could be propagated by cuttage to include Snowdrift, Candied Apple, Sugar Tyme, Silver Moon, *Malus sargentii*, Sentinel, Mary Potter, and Red Jewel. Researchers had thus introduced and confirmed several important factors:

1. Propagation of trees by cuttage is possible, but one cannot make a generalization that all sugar maples can be propagated by cuttage. Individual trees must be tried until successful, then propagate that individual as a clone.

2. Plants to be propagated by softwood cuttage must reach a certain stage of physiological maturity. *Malus* cuttings taken after rapid elongation (new growth) is completed is an example. Sugar maple, when leaves reach full growth and petioles become slightly red, is another.

These identifiable morphological characteristics indicate that there is a specific physiological state of maturing for each plant at which propagation by cuttage is optimal.

Clonal, or cultivar selection, is often made for some desirable phenotypic characteristic, like disease resistance, environmental tolerance, habit, flower color, foliar color and/or fruit size and color. Some suggest that another criterion when selecting trees for clonal production is its ability to be propagated by cuttage in commercially acceptable percentages.

The list grows

Many plants have now been reported propagatable by cuttage (see table). Much of this research has been done in the Northeast and Midwest; therefore, the optimal period would change as one moves south, but the physiological stage remains the same.

When developing new cultivars, a frequent problem is being able to propagate a large enough number of individuals quickly from the mother plant to make it profitable. Tissue culture is the preferred propagation technique used for rapidly developing a large number of individuals from a single mother plant. It has been reported that that one can propagate cultivars of red maple by tissue culture.

The advantages of propagating trees by cuttage includes: little or no suckering, no incompatibility and a rapid growth rate compared to other propagation techniques.

A large number of shade trees are propagated by cuttage as evidenced by G.M. Moller's 1985 report that *Acer ginnala*, A. rudrum, Amelanchier, Cercidiphylum, Cornus kousa, Platanus, Prunus, Malus, cv. and *Tilia* were propogated by cuttage. Others reported trees propagated by cuttage include some of the more outstanding cultivars of crab apple, Donald Wyman, Mary Potter, Profusion, Red Jewel, Sugar Tyme, Snowdrift and Selkirk, and *Tilia cordata* clones. In adition, the reported propagation of *Cornus florida* by softwood cuttage has become significant in the nursery industry.

During the next several years, it appears that there will be a great increase in the number of shade trees propagated by cuttage and/or tissue culture. This is not to indicate that the other techniques, such as seedage or budding, will not be continued. But where possible, propagation by cuttage requires a less-skilled propagator, eliminates incompatibility and reduces suckering. It also results in trees available for sale that are economical and of high quality. **LM**

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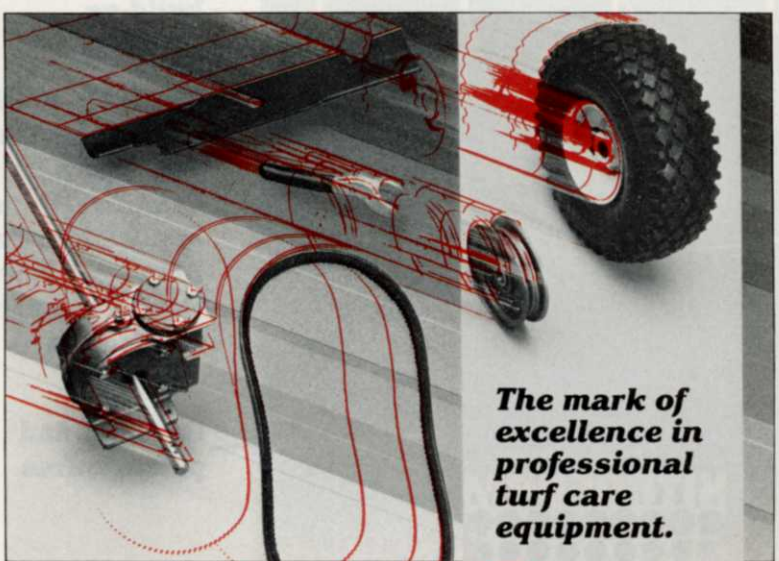

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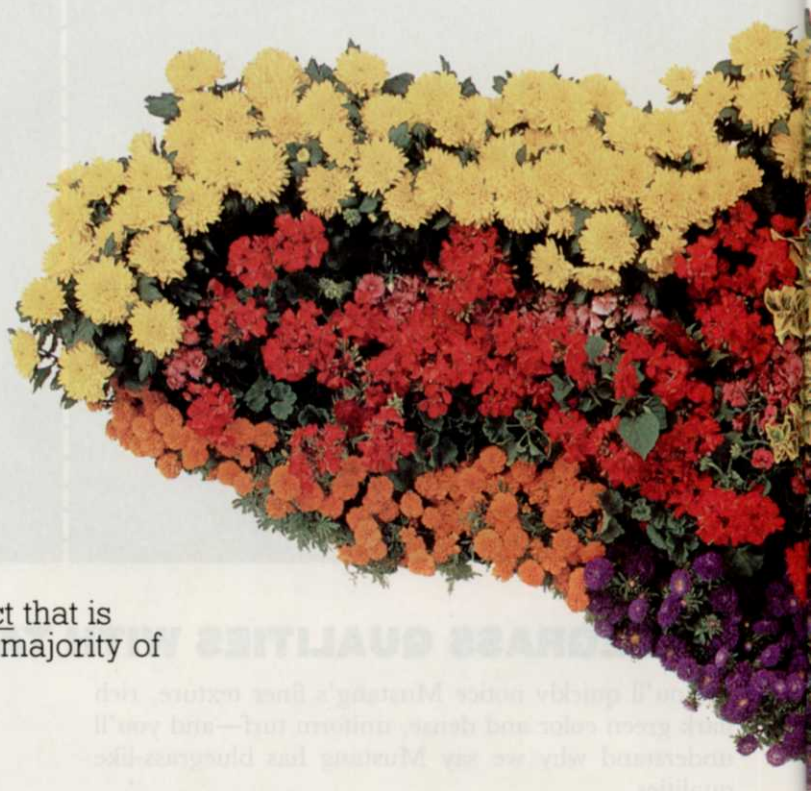

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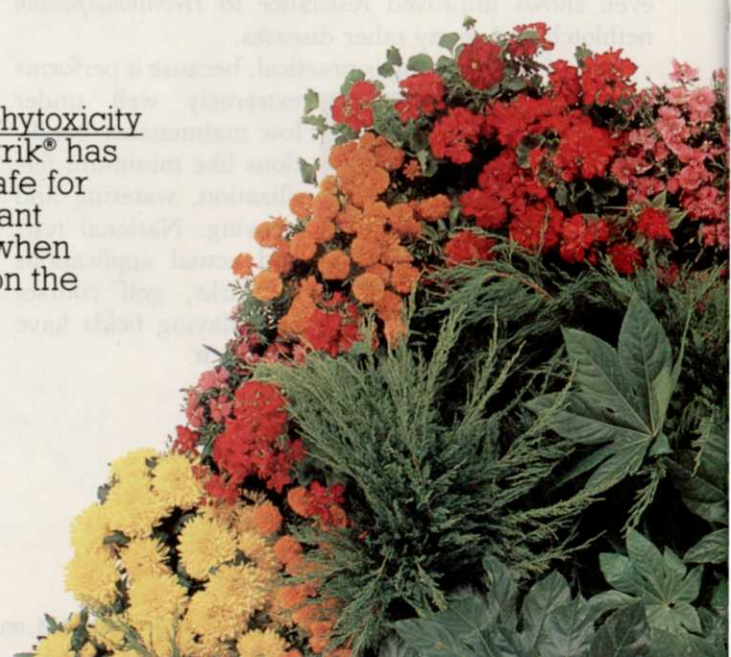

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The avid golfer on the left told the photographer that this "Flower Hole" is the most beautiful golf hole in the country.

THE SENTRY'S WATCHDOG

Anywhere you travel in Wisconsin to talk golf, the subject always turns to the course and the corporate layout at Stevens Point. That's Sentry Insurance headquarters and Sentry World-and Dave Reit is the Sentry's watchdog.

by Jerry Roche, editor

It is inarguably the most beautiful golf hole in the country. It is, at least, according to one well-traveled golfer playing the course last summer.

It is the par three, 145-yard No. 16 hole at Sentry World in Stevens Point, Wisc., guarded by 80,000 flowers. It was designed jointly by Robert Trent Jones and John Jonais, who was chairman of the board of Sentry Insurance until his death three years ago.

But the "Flower Hole" is just one interesting point of Sentry's amazing complex, nestled smack dab in the middle of dairy country. The company has its headquarters building, downtown home office, a one-acre employees park, a corporate hangar at the local airport and Sentry World. The latter consists of the public golf course, six indoor and six outdoor tennis courts, racquetball courts, a squash court and banquet facilities for up to 1500 people.

It's no wonder, then, that the person in charge is no normal "landscape manager." His formal title is "facility superintendent" and his name is Dave Reit.

Reit must care for 420 acres, including the 80-acre national headquarters and the 256-acre golf course (66 playable acres). And he must do it while contending with budget cutbacks.

Jonais, a certified landscape architect, took great pride in the landscape. But since profit margins have de-

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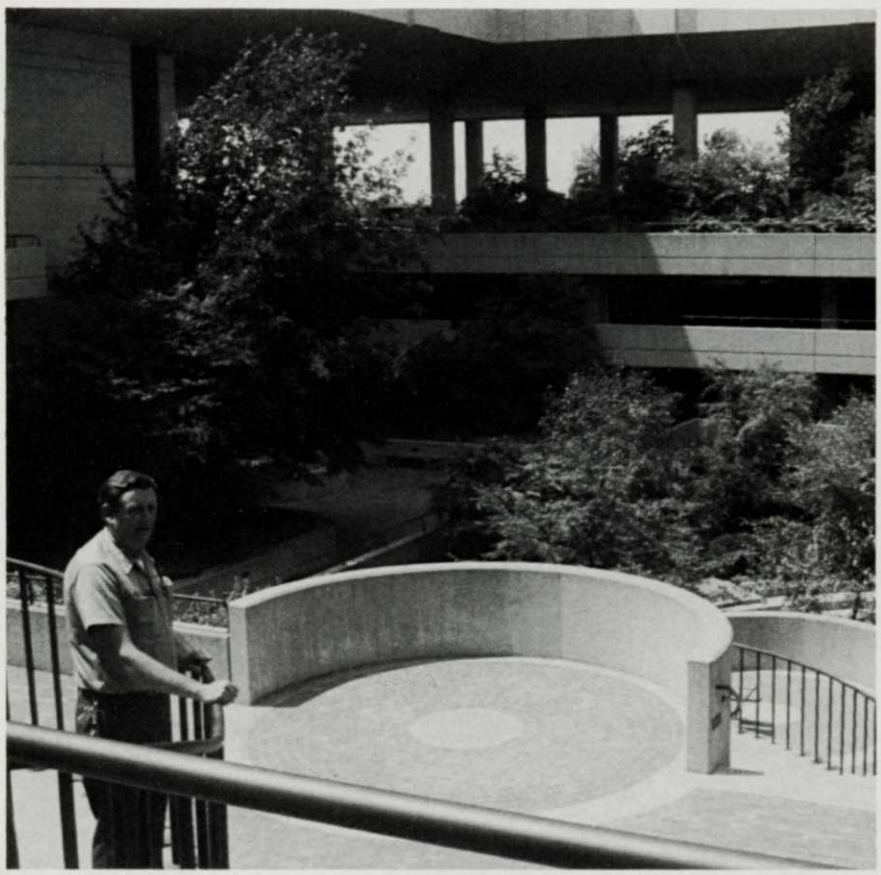
Flowers are a strong feature of the Sentry Insurance Company's national headquarters building.



Dave Reit surveys the headquarter's atrium, "designed to blend into as much the countryside as possible."

creased, Sentry board members have taken stock of the company's finances and cut back in some areas.

"For the company to be stable and grow is the prime concern," says Reit. "We don't do things the way we used to. It's been a big kick in the teeth to morale since Mr. Jonais died.

"Working 12 to 13 hours a day, six—sometimes seven—days in a row puts a hell of a demand on us. You've got to have good, reliable people. There's an awful lot of talent there, an awful lot of good, new ideas being generated by them. We just can't do things the way we used to."

This is not to say that Reit's hands are completely tied. He still controls $175,000 for the headquarters' landscape and an additional $500,000 for the golf course, greenhouse and employee park.

It helps, too, that Sentry has three mechanics who are qualified on the company's lapping machines, milling machines and metal lathe. "We do all our own repair work," Reit notes.

The maintenance facility's size is testament to the amount of work done: 120 by 460 feet with a full paint shop included. (That's about the size of 1½ football fields.)

Training is also rather inexpensive. That, too, is done totally in-house. "There are not a lot of sources available in central Wisconsin," Reit adds. "You pretty much have to be self-sufficient in a town this size. That's the key to all of our maintenance."

Flowering up

Like on the "Flower Hole," annuals are a big part of the entire facility's beauty. The main building's courtyard contains more than 15,000 annuals (down from 35,000 in past years). For weddings, special flowering almond, forsythia, hydrangia, witch hazel and hazelnut plants are put in.

At the entrance to Sentry World are basil, coleus and geraniums. "But we're going more and more to perennial flowers like shasta daisies," says Reit.

Sentry, of course, has its own greenhouses. At present, there are 220,000 annuals in stock, some of which are sold commercially.

Reit has been landscape supervisor for eight years. His predecessor, Bill Roberts, a turf graduate of Penn State University, is now superintendent at Lochmoor Country Club in Grosse Pointe Woods, Mich. "Bill had a heck of an impact on the way the course looks today," credits Reit.

The complex has a fascinating irrigation system. It features 7,000 heads,

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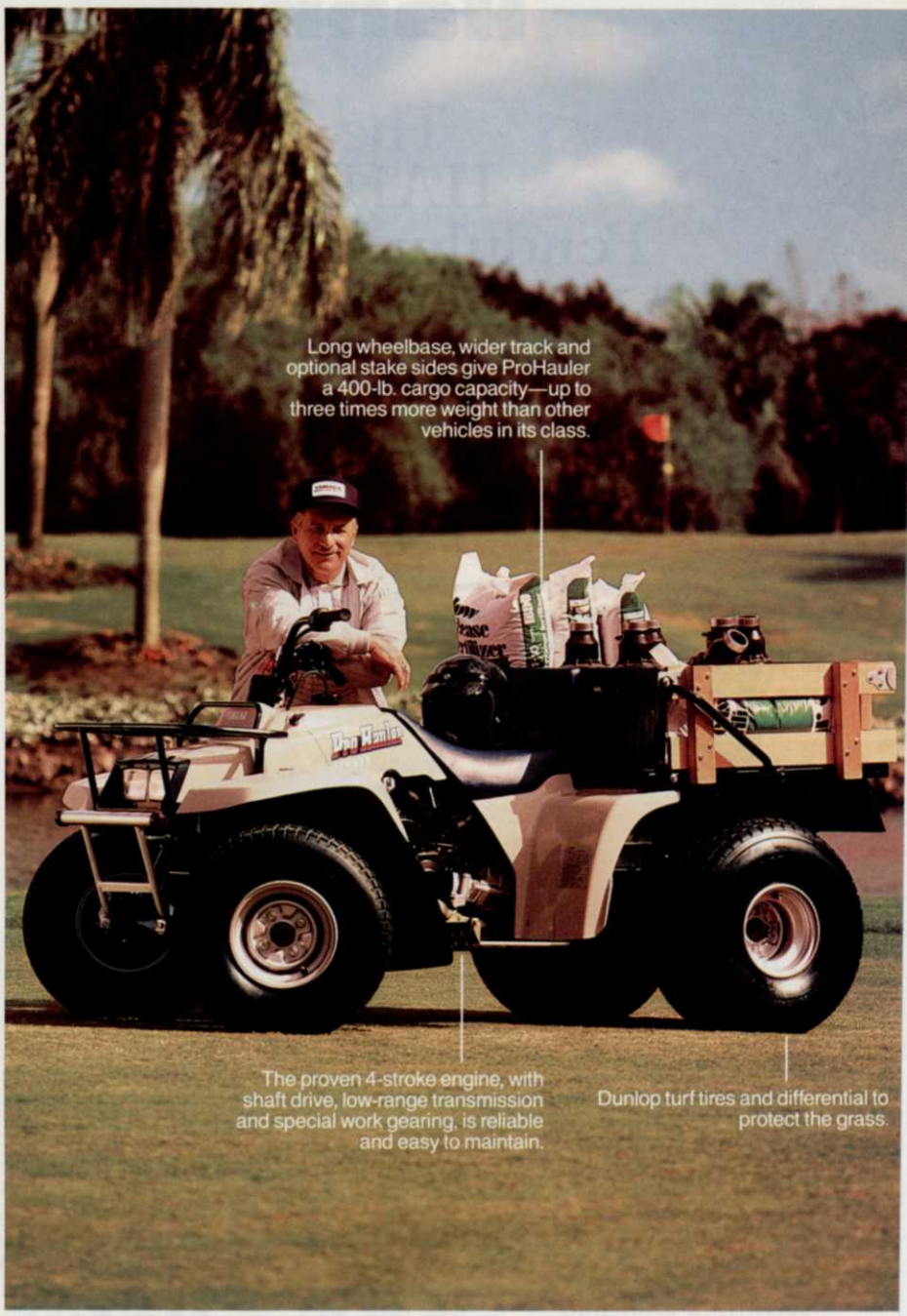
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50 miles of piping and 70 controllers running off two main controllers. The buildings have Toro controllers and heads; there are some RainBird heads in outlying areas. The golf course has Buckner equipment with a PSI pumping system. The entire system is capable of pushing 5,000 gallons per minute on all sites.

On the golf course fairways, four-inch irrigation pipes are spaced four feet apart. Water is pumped in from a half-mile of man-made creekways carved out of the swamp when the complex was built in 1981.

Originally, 50 percent of the golf course was woods, 30 percent was swamp and 20 percent was wasteland.

The real keys

Reit is especially proud of the golf course. "The real keys to a good course are fertilization, coring and irrigation," he says.

Among the fertilizers he has incorporated into the regime are Scott's 15-0-30 and Par Ex 24-4-12 for fairways; Milorganite 6-2-0 plus an additional 20-0-16 for greens and tees. Roughs get Lebanon 20-10-20. Occasionally, depending on conditions, urea, sulfur and/or potash are added. Fertilization is "pretty much spread throughout the year," Reit notes.Bayleton, Subdue and Chipco 26019 are used to avoid dollar spot. Daconil 2787, Thiram and an Alliette/Rubigan/Daconil combination are used for other diseases.

The biggest insect problem at Sentry World is the cutworm. So Reit uses two applications of Proxol at the proper time to keep populations down.

Complementing the pesticides is $2 million worth of equipment: 18 maintenance trucks and 250 other pieces of equipment. Also, nearly 500,000 parts are kept in stock.

Sentry World owns four John Deere tractors, some models 420 and 755; a JI Case front-end loader, a Ford/New Holland backhoe and 25 Cushman utility vehicles.

Jacobsen mowers are used on the fairways and greens, along with Toro Greensmaster 2s. The equipment inventory even includes a Hi-Ranger tree truck and a tree transplanting truck.

The course has 26 acres of Penneagle and Penncross fairways. The 40 acres of playable rough are bluegrass. Tees and fairways are mowed at 3/16-inch, greens at 5/32-inch and playable roughs at 2 inches.

The other component to a good golf course, according to Reit? Aeration, which reduced thatch and compaction. As a matter of fact, thatch on the course was reduced from three inches to ¾-inch in less than one year.

"One man spent the whole summer coring the hell out of the course," Reit notes. "We core around midnight and pick up debris at 4:30 a.m."

Dry times

Despite last summer's drought, the course was kept in fine shape.

"We had to make some adjustments on some of the outlying areas, eliminating water. Some of the areas which you could call 'readily playable' we had to let go," remembers Reit.

"Everybody was pretty well suffering. The employees realized what we were up against. But we pretty much kept top management involved. There's just no way you can substitute for Mother Nature."

But when Mother Nature turns on her spring thaw, you can be sure that the new set of earlybird golfers will again be greeted by, maybe, the most beautiful golf hole in the country. And, maybe, by the most beautiful course around. **LM**

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Circle No. 115 on Reader Inquiry Card

ARE YOUR EMPLOYEES LEGAL?

It is the employer's responsibility to make sure he has no illegal aliens on his payroll. The penalties for not complying are strict.

by Richard I. Lehr

On Nov. 6, 1986, President Reagan signed into law perhaps the most sweeping statue affecting immigration and employment. The Immigration Reform and Control Act became effective on Jan. 1, 1987. A formal grace period—during which time employers did not receive citations for an initial violation—expired May 31, 1988. The act has two essential provisions of note:

1) If a company employs four or more, it may not discriminate based on citizenship or national origin.

2) Regardless of the number of employees, the employer must fill out Form I-9, indicating an employee's identification and eligibility to work.

No discrimination

An Office of Special Counsel in the Justice Department will investigate and prosecute alleged discrimination based on citizenship or national origin. A special panel of administrative law judges will hear these cases. An administrative law judge decision may be appealed to the United States Court of Appeals.

If the Special Counsel fails to bring an action within 120 days after receiving notification of the alleged complaint, a person can take legal action through private counsel. If a winner, the person is entitled to receive attorney fees, costs, reinstatement, back pay and other compensation.

"Citizenship status" as a basis for discrimination refers to someone who has or is intending to apply for United States citizenship. Thus, discrimination could be the case if a person applied for a job, provided the appropriate alien documents and was otherwise qualified for the job—yet was not hired.

While Title VII of the 1964 Civil Rights Act covers employers with 15 or more employees, the anti-discrimination provisions of the Immigration Act cover employers with four or more employees.

The new act does not require affirmative action when employers are considering hiring a person seeking U.S. citizenship. If an alien applies for employment and is as qualified as a United States citizen, the employer may hire the citizen as a preference without violating this act.

As a practical suggestion, employment applications that give company philosophy on not considering certain factors (race, color, religion, etc.) as a basis for employment, should also add "citizenship status" to that list.

Citizenship status

An employer must verify the citizenship status of applicants for employment. Four steps must be taken:

1. The employer must examine the appropriate documents before hiring.

2. The employer must verify Immigration and Naturalization Form I-9: (a) that the appropriate documents regarding citizenship have been reviewed by the employer and (b) the employee who is hired is not an illegal alien. The verification must be completed within three days of when the employee begins work.

3. The employer must be sure that the employee completes the "employee" provisions of the form.

4. The employer must retain this form for a period of three years, or one year after the employment relationship is terminated, whichever is longer.

Employers are not required to retain copies of the documents provided by the employee, just a copy of the I-9 form.

The three categories of verification documents are: Group A, Group B and Group C. According to the act, any one of the following Group A documents would be sufficient to establish employment authorization and identity:

- U.S. passport; or
- certificate of U.S. Citizenship; or
- Certificate of Naturalization; or
- unexpired foreign passport; or
- Resident Alien Card or another type of registration card approved by the Attorney General.

Group B documents relate to only employment authorization. Group C documents relate to only the identity of the alien.

If presented with a Group B type of document, you then must also review a Group C document relating to identity. A Group A document covers both identity and authorization.

continued on page 92

Richard I. Lehr is a partner in the Birmingham, Ala. law firm Sirote, Pirmutt, Friend, Friedman, Held & Apolinsky. He is legal counsel for the Professional Lawn Care Association of America.

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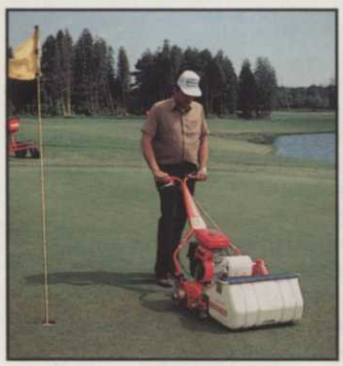

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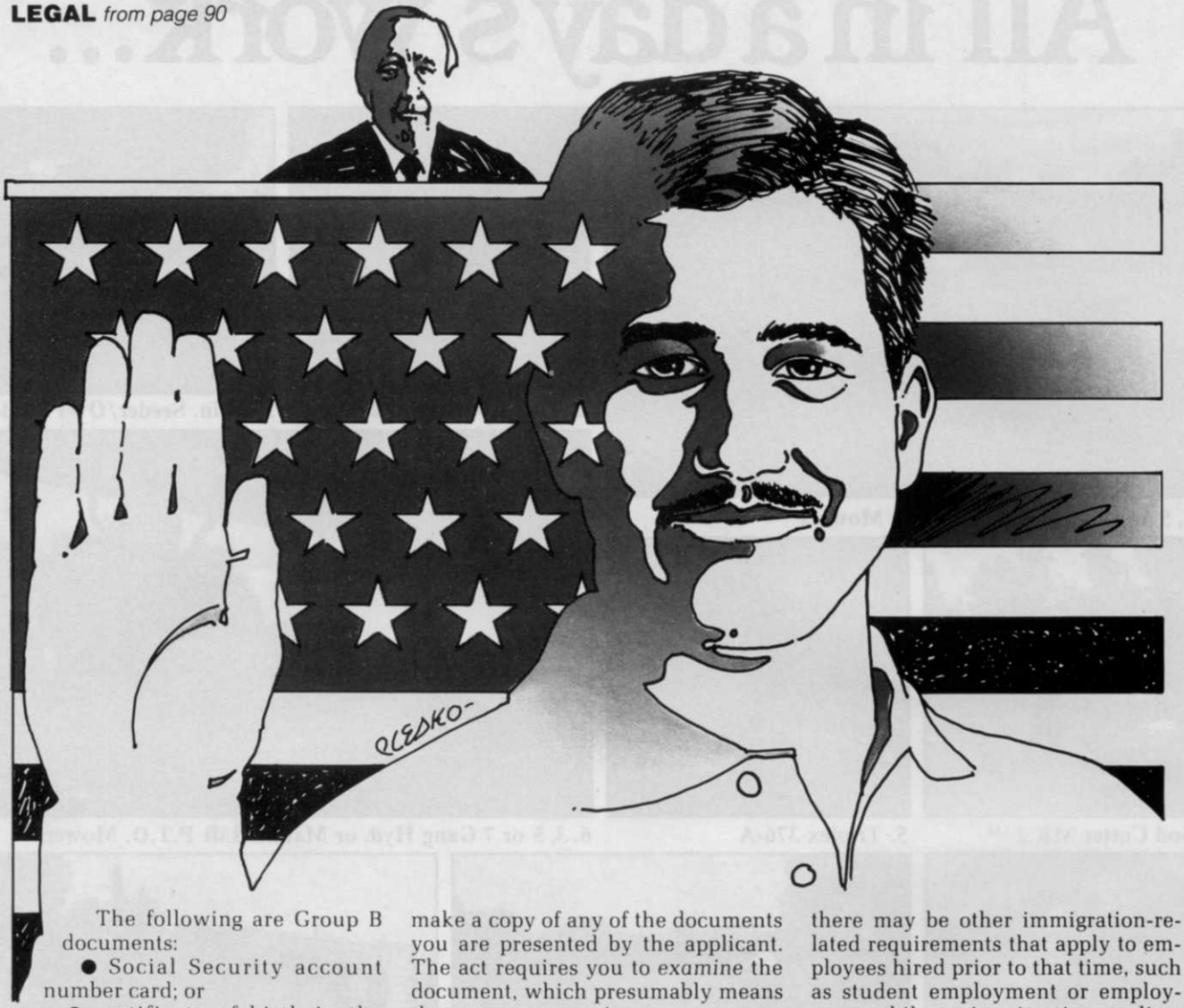
88-96

Circle No. 105 on Reader Inquiry Card

LEGAL *from page 90*



The following are Group B documents:

- Social Security account number card; or
- certificate of birth in the United States; or
- establishment of U.S. nationality at birth as approved by the Attorney General; or
- **any other documentation approved by the Attorney General that demonstrates authorization of employment in this country.**

Group C documents are considered to be either:

- a driver's license, or a similar document, provided that it contains a photograph or other personal identification approved by the Attorney General; or
- (for applicants under age 16) other documentation that has been approved by the Attorney General.

Note that you are not required to make a copy of any of the documents you are presented by the applicant. The act requires you to *examine* the document, which presumably means that you may examine a copy.

If the document you have reviewed appears to be genuine and if it meets the standards of a Group A, B or C document, do not ask for any further identification. It would be discriminatory, for example, to request all documents in all groups, when one document in Group A or one document each from Group B and C would be sufficient.

If you are concerned about hiring a person while waiting for citizenship verification, we suggest telling the person in writing that his continued employment will be contingent upon the verification. Practical suggestions:

1. The act does not require employers to document employees who were hired prior to Nov. 7, 1986. However, there may be other immigration-related requirements that apply to employees hired prior to that time, such as student employment or employment while an immigration application is pending.

2. The verification method anticipates an employer reasonably concluding whether it appears to be genuine. If an employer has any doubt about the genuineness of a document, ask the applicant if he has the original or another document that would satisfy the Immigration Act. If the person does not have such documents, then tell him that under the act, you believe you are required to seek verification from the agency involved.

3. Begin the document verification process after you have decided that the person is otherwise qualified for the job. If the person is hired before final verification, tell him or her that continued employment is contingent upon verification, within three days of when the individual begins to work.

4. Let the individual know that it is his or her obligation to report to you promptly any change in citizenship status.

The new act does not require affirmative action when employers are considering hiring a person seeking U.S. citizenship.

continued on page 94

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LEGAL *from page 92*

Answer file: illegal aliens

How many undocumented aliens reside in this country? *Between 3 and 12 million.*

What is their growth rate? *Annual growth since 1980 has been between 100,000 and 300,000. More than 1 million undocumented aliens have been apprehended each year along the U.S./Mexico border.*

What is the current ceiling on legal immigration? *270,000 per year. This figure, however, does not include the unlimited categories of immigrants, such as immediate relatives of U.S. citizens and refugees. If they are included, the total legal immigrants approximate 570,000 each year.*

How much does illegal immigration cost United States taxpayers? *According to a 1983 study by the Immigration and Naturalization Service, each 1 million undocumented aliens costs federal, state and local governments $2.5 billion annually in job displacement, police costs, education, welfare benefits and unemployment insurance. An estimated $995 million was paid in taxes, resulting in a net government loss of $1.2 billion per million undocumented aliens.*

□

5. If you rely on employment services or state employment agencies to refer employees to you, be sure to find out who is responsible for the employment verification process. If done by them, ask them for a copy of the form they use to verify the individual's documentation, and include a copy of that in the personnel file.

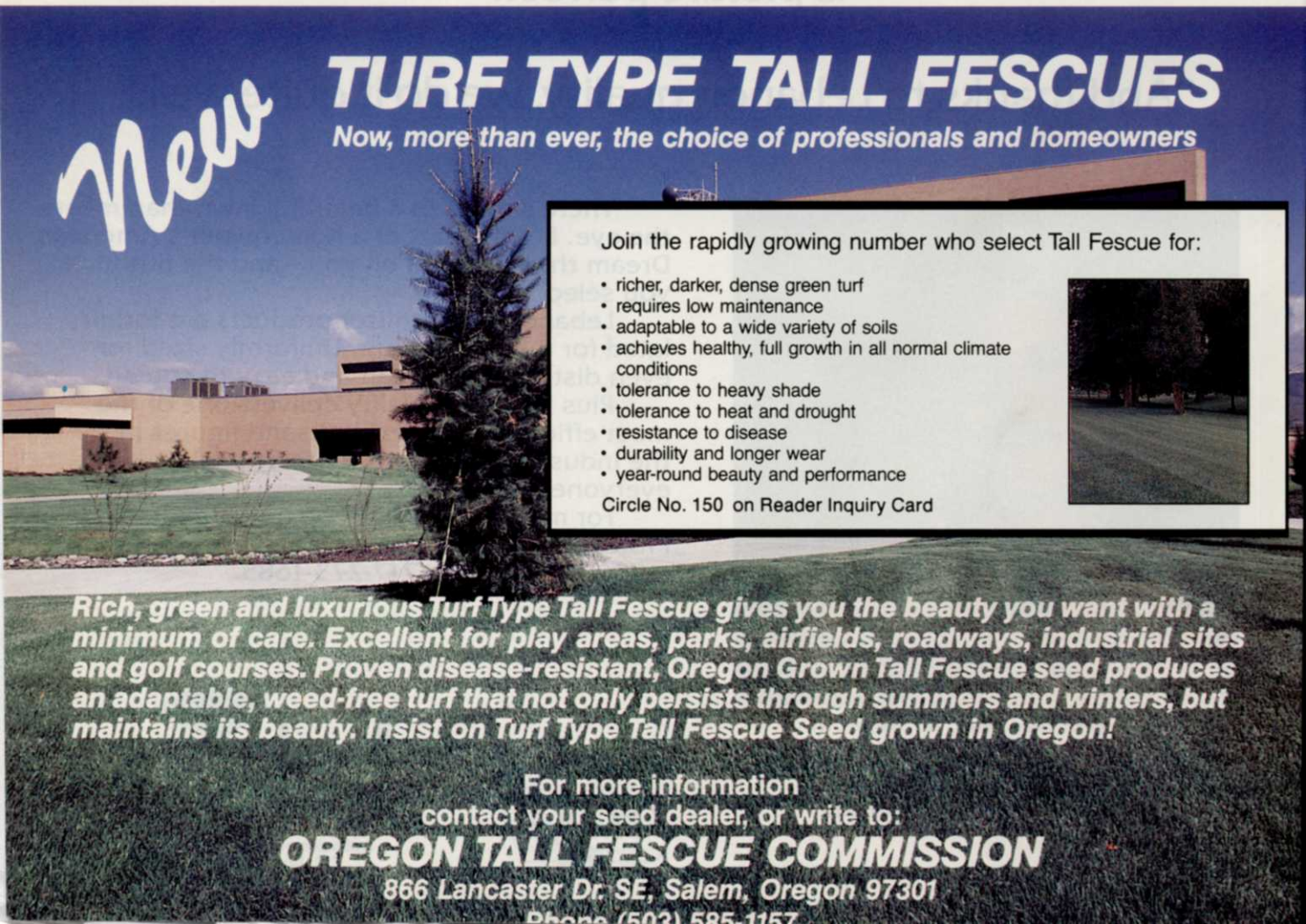
Employer risks

Employers who violate the act face severe penalties, both civil and criminal. For a first offense, the fines range from $250 to $2,000 per unauthorized alien employed; $2,000 to $5,000 for a second offense; $3,000 to $10,000 for a third offense. These penalties will not attach to the employer until after a hearing is set. A defense to this would be the good faith effort that the employer made to review the propriety of the documentation before the individual was hired.

In addition to the civil penalties mentioned above, criminal penalties may include up to six months imprisonment and a $3,000 fine per unauthorized alien if the employer is found to have engaged in a pattern or practice of violating the Immigration Reform and Control Act.

Those individuals who were hired prior to Nov. 7, 1986, are exempt from this statute. However, the individual employee is not protected if he has violated other provisions of immigration laws that existed prior to this act.

Employers who attempt to assist in the registration of illegal aliens for permanent status must still comply with the procedures that were in place prior to the enactment of the Immigration Reform and Control Act of 1986. **LM**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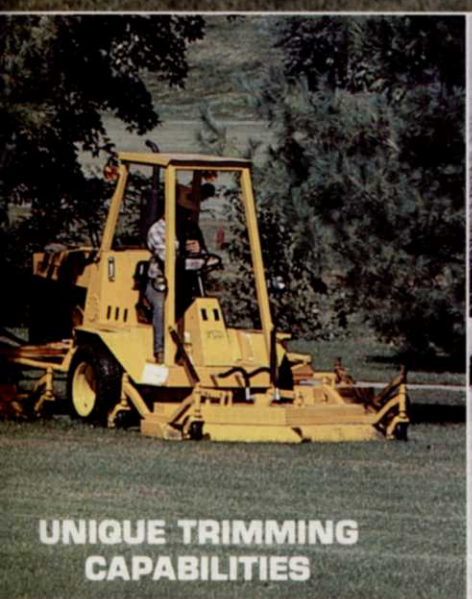

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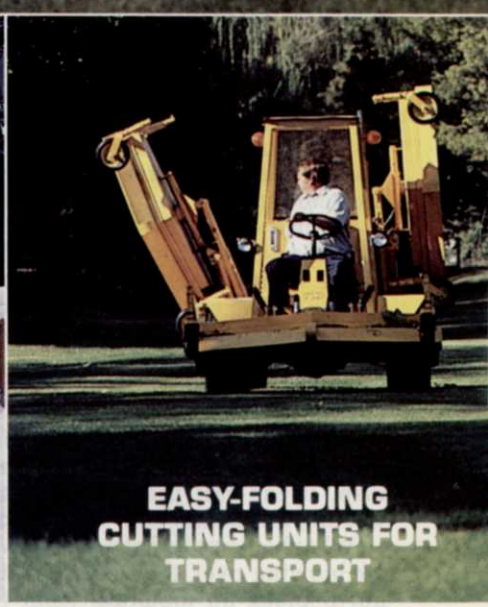

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EMERGENCY!

Crews at Cleveland Hopkins Airport are schooled in immediate mobilization, for times when hundreds of airline passengers' lives depend on the snow removal job they do.

By Carl Kovac

Few things are as useless as snow-bound airplanes sitting on the ground when there are passengers and freight to be hauled and schedules to be met. Even fewer things are as disturbing as not being able to land, particularly if the low-fuel lights start flickering. The alterative could be trying to put a very large airplane down on an ice-slick runway at a relatively high speed. A loaded 747, for example, has a landing weight in excess of 300 tons and touches down at around 140 miles per hour.

At Cleveland Hopkins International Airport, a highly-trained field maintenance team keeps the airlines flying when the snow falls. About the only things that will close the sprawling airport 14 road miles southwest of downtown Cleveland are zero-zero visibility and high winds, over which the maintenance crews obviously have no control.

Normal snowfall at Hopkins is 53 inches a year, according to the National Weather Service. The record for one month was 42.8 inches in January 1978.

Graders and front-end loaders are used to clear snow from around aircraft at the gates.

Fickle weather

Greater Cleveland is known for its fickle weather. Because Hopkins is a mere five miles due south of Lake Erie, it can fall prey to what the weather forecasters call "lake effect."

What happens is that a cold flow of air blowing over the lake from the north picks up moisture from the warmer water. This rising moisture condenses at altitude and comes down as snow. Ordinarily this precipitation is carried to higher elevations east of Cleveland—the so-called snow belt—but a wind blowing directly from the north will occasionally dump an awful lot of the white stuff on the airport in a very short time.

On the other hand, a storm can sneak in the back door, as happened March 30-31, 1987. A jet stream swinging down from Canada through the deep south picked up moisture-laden air in East Cleveland around evening rush-hour time and dropped 16.4 inches of snow within 24 hours, the largest one-day accumulation in the area in 74 years.

Hopkins was shut down twice for a total of 12 hours because of high winds and low visibility. Some 200 flights were reportedly diverted or cancelled. It was the longest shutdown since January 1978 "when we were closed for a couple of days because of high winds—up to 50 mile an hour—and blowing snow," recalls airport commissioner Nick Bogas.

Expensive equipment

Keeping Hopkins' some 3.4 million square feet of runways and taxiways clear for arriving and departing aircraft is the job of a 40 on the field maintenance staff using $4 million worth of snow removal equipment. "We have 51 pieces of equipment, including trucks, snow blowers, high-speed brooms, front-end loaders, road graders and truck-mounted plows," says Bogas. In addition, four graders, four front-end loaders and six trucks are leased from an outside contractor, but garaged at the airport, ready for instant use.

Graders and front-end loaders are used to clear snow from around aircraft at the gates; 28-foot plows clean

Carl Kovac is a freelance writer based in Cleveland, Ohio. Assistant editor Jeff Sobul also contributed to this article.

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At Cleveland Hopkins Airport, 28-foot plows clean the runways and taxiways.

the runways and taxiways; and 12-footers are used for roads on airport property. Hopkins also has about 35 acres of parking lots; six-foot and eight-foot plows mounted on Bombardier tracked vehicles are used to keep them clear.

At the first hint of snow, the high-speed brooms begin sweeping the runways. "If that doesn't work, we'll put down urea, which is a standard fertilizer that melts snow. If we get ice, we'll use ethyl glycol, used to de-ice airplanes," Bogas says.

To keep the main runway, the first priority, clean, a team of four 28-foot plows and two blowers are deployed to work in tandem. A second team is deployed to keep the secondary runway, parallel to the main one, clean. At the same time, other crews are busy clearing taxiways, ramps and other runways.

Ordinarily, Hopkins' maintenance crews work normal eight-hour shifts. There are two shifts a day on duty, seven days a week. If a big storm hits, everyone gets into the act.

"The crew on duty will begin clearing the runways and taxiways while the second crew is being called in," says Bogas. "The crews will sleep and eat at the field until things are back to normal. We'll work 12-hour overlapping shifts. We try not to work them longer, but if need be, we will."

By "we," Bogas means everyone. "In addition to the regular crews, we have a dozen supervisory personnel, including me, plus 10 mechanics who can operate the equipment. We're all checked out on it."

Just how good his people do their jobs is evidenced by the fact that Hopkins was shut down only once this year, "and that," says Bogas, "was because of poor visibility. We had blowing snow and 40- to 50-knot winds. There's not much you can do about that." **LM**

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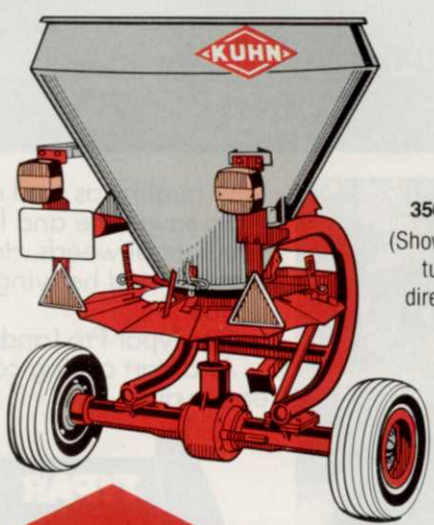

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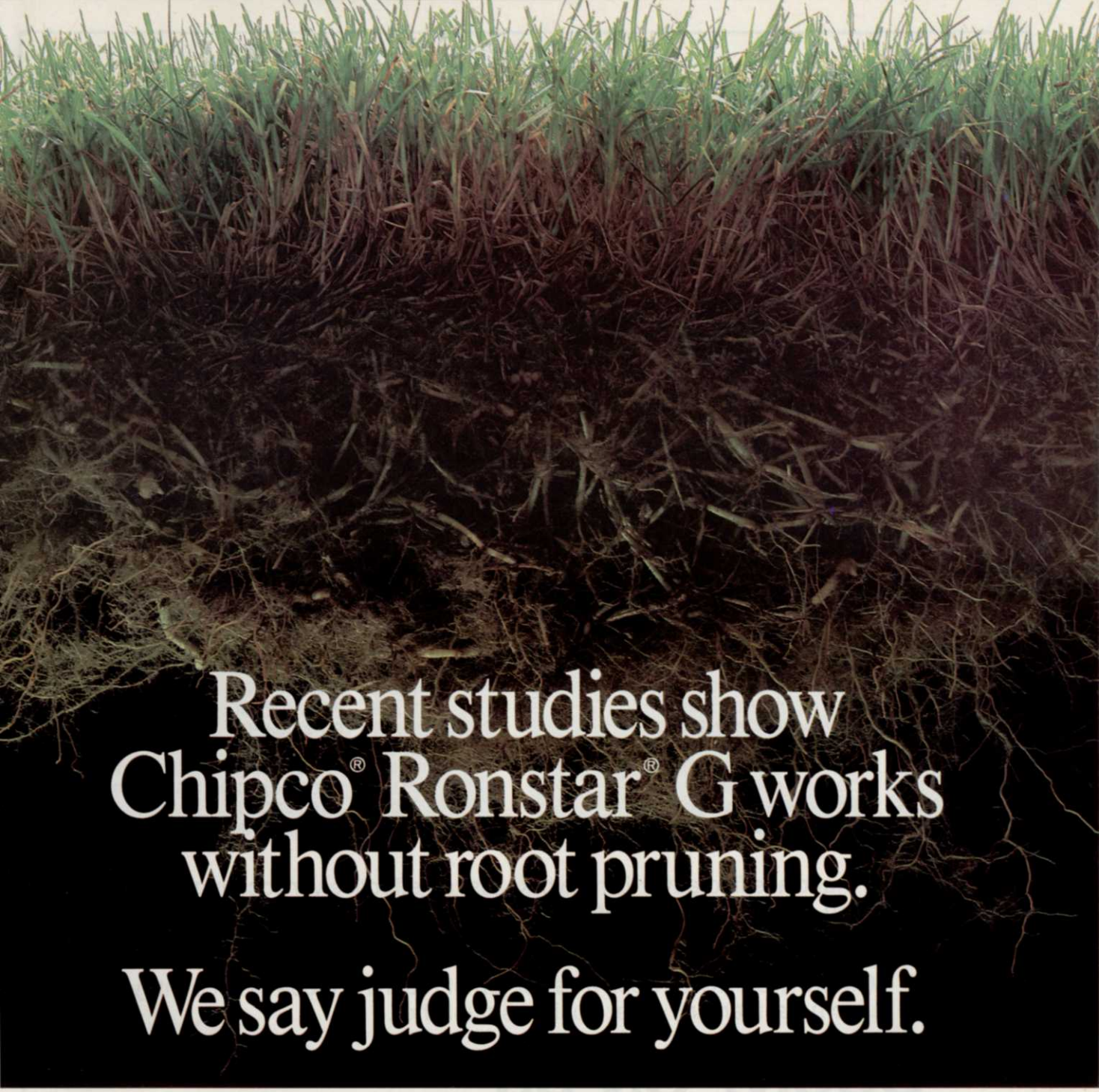

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LM

'KENT' OUTSHINES COMMON WHITE CLOVER

Although white clover in a lawn can be slippery, stain clothes and is unsightly to some, many prefer it to a grass monoculture.

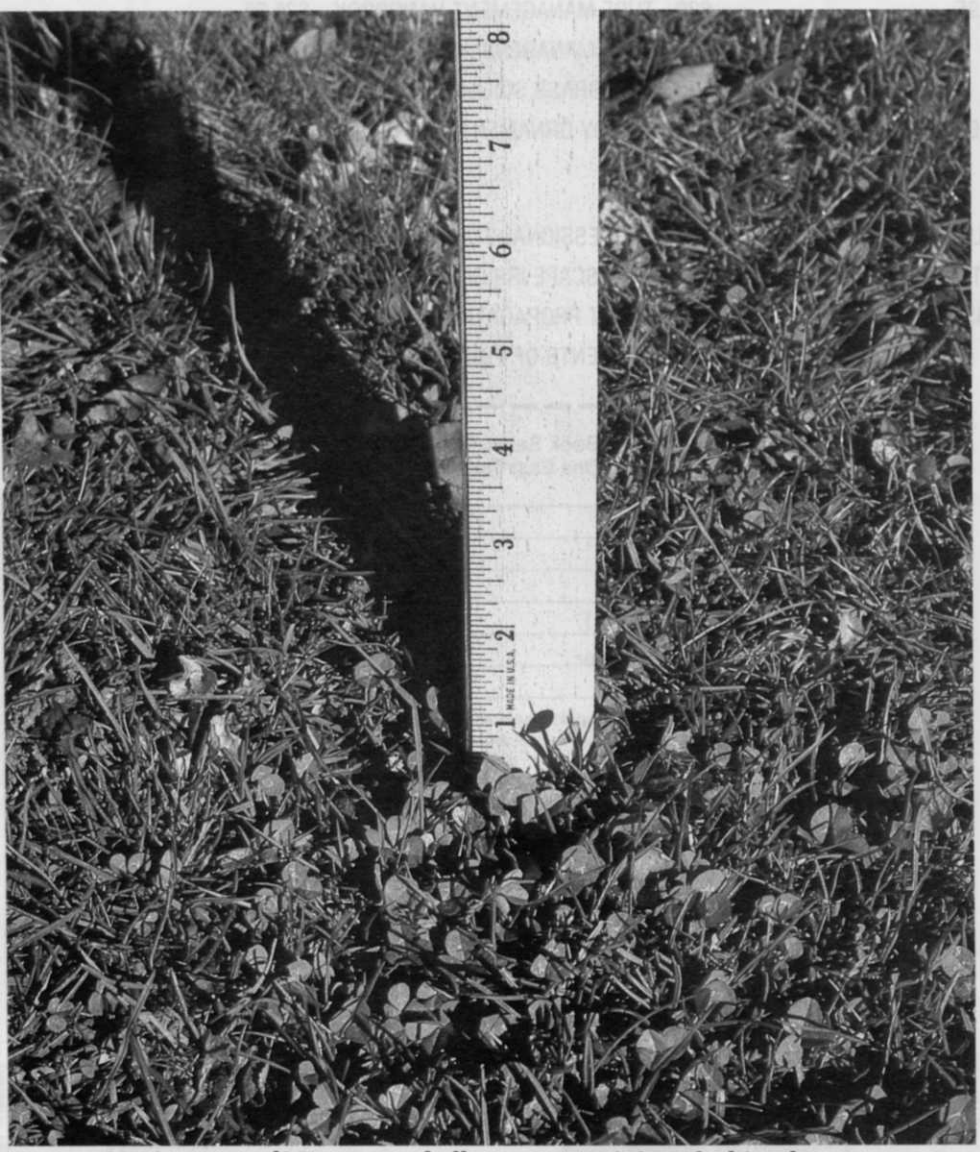
by R. E. DeGregorio and R. A. Ashley, Dept. of Plant Science, Univ. of Connecticut.

Landscapers are often surprised to discover the advantages of having white clover present in a lawn. Many are delighted to find that white clover offers a biological production of a slow release nitrogen fertilizer (clover seed should be inoculated), has deeper roots than many lawn grasses—implying some drought tolerance—and that it thickens sod. Also, some grass pests do not damage white clover, and ecosystem diversity more often than not decreases pest epidemics.

We found a grass and legume cover crop mixture to contain fewer weeds than either the grass or the legume grown as a monoculture. In England a white clover cover crop "successfully dominated" annual bluegrass and chickweed (Cerastium sp.).

"Kent" white clover is considerably shorter than common white clover. The latter is sometimes referred to as "Dutch," but this term is scientifically and legally meaningless. However, as long as the myth of "Dutch" white clover is perpetuated, the lawn industry and lawn owners are likely to perceive white clover as a weed.

Common white clover may be any of the three types of white clover (small, intermediate, or large) but is usually intermediate. We suspect that much of the problem with white clover in lawns is due to the height, leaflet and stolon size, abundance of flowers, and lack of persistence of common white clover.



Not just a weed? Kent may challenge your opinion of white clover.

Benefits of 'Kent'

Kent is not only shorter than common white clover, it also has smaller leaflets and stolons, and flowers less profusely and over a shorter period of time. There are also reports and observations of Kent, or the small white clover type in general, persisting longer, being more resistant to molluscs and mites and requiring less water.

We recently have observed considerably fewer Japanese beetles and leafminers on Kent than on common white clover. These results are of interest because of the problem of Japanese beetle larvae in lawns and adults on landscape plants. Leafminers can harm forage legumes.

In England a white clover cover crop 'successfully dominated' annual bluegrass.

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lishment and maintenance of white clover, as identified by those working with white clover for pasture and as a living mulch for row crops. However, a reduction in nitrogen fertilizer after the lawn is established may be economical, ecological and beneficial to the persistence of white clover. Abundant potassium and moderate phosphorus and lime will also favor clover and disfavor some weeds.

The remaining barrier to increased use of Kent is the inconvenience of obtaining seed and its higher price compared to common white clover. Seed of certified Kent white clover can be obtained by simply writing to Goldsmith Seeds, Bury St. Edmunds, England, where you can receive price information as well. Whatever amount you send Goldsmith Seeds, the company will send you as much seed as that amount will buy, less enough for surface mail, which takes two to three weeks.

Considering cost

If seed cost is the only factor in deciding whether to use Kent or common white clover, the size of the area to be seeded would be the primary consideration. However, it would seem "penny wise and pound foolish" not to spend an additional 10 cents or so per 1,000 square feet for a nicer lawn. Landscapers may distinguish themselves as unique within a certain geographical area in offering this certified clover and charge accordingly.

As long as the myth of 'Dutch' white clover is perpetuated, the lawn industry and lawn owners are likely to regard white clover as a weed.

The purity of the Kent white clover seed lot we used, according to Goldsmith Seeds, was 99.1 percent and total germination 94 percent (hard seed eventually germinates and may actually be insurance if the seeds that quickly germinate fail to establish). Thus pure live seed was (.991) × (.94) or 93 percent. Our most recently used common white clover seed, which was labelled "extra fancy" and intended for use in lawns, was 90 percent pure live seed. Combining the extra 16 percent seed due to Kent's small seed size and the 3 percent extra pure live seed, one might use 19 percent less weight of Kent, reducing the expense to about 81 percent of the originally estimated cost. Of course seed viability and purity can vary from year to year and source to source.

Further research and development is needed to determine if and in which climates the potential advantages of Kent white clover in lawns exist. We note that some large, rather attractive lawns on the grounds of this university contain a considerable amount of small white clover. Perhaps this clover was chosen because these sites have undergone years of frequent mowing at a low stubble height, similar to the 10 or more years of pasturing necessary prior to certification of Kent as a wild white clover.

It seems likely that many of today's lawn owners, after reading about pesticides, nitrate and groundwater contamination, will be willing to accept clover in a lawn. If so, Kent seems worth the extra cost, at least for smaller lawns or on a trial basis. **LM**

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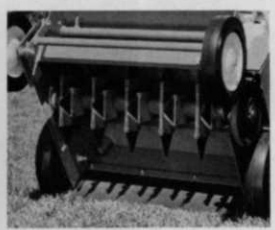

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ONE STEP BEYOND

Lawn care operators that say they are going to diversify may find it's 'easier said than done.' And it might make or break your business.

by Rudd McGary, Ph.D.

The marketplaces of the country are becoming more saturated with companies offering lawn care and landscape services. Consequently, diversification becomes one of the major avenues for these companies to earn more money from their current customer base.

In many cases, only through diversification can you achieve the type of growth you want. In many cases, the markets have so many companies offering the same services that it is extremely difficult to continue previous growth patterns.

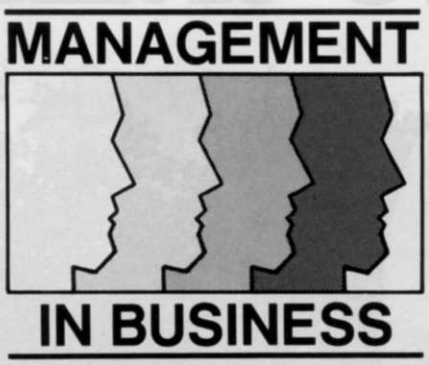
Several issues should be considered when diversifying. Failure to consider these will result in problems.

Why more?

The first consideration is the reason behind offering new services.

For many companies, it is necessary to diversify. The growth rate in one type of service just isn't sufficient for many companies. This is especially true of companies that have been in business for a number of years and which have worked very hard to build up a loyal customer base. In this case, diversifying makes sense.

Rudd McGary, Ph.D., is a senior consultant with All-Green Management Associates, Columbus, Ohio.



There are, however, some companies that decide to diversify simply because "the thrill is gone." When the company was just starting, there was a certain excitement. Everyone put in long hours, did all the jobs, and were driven by starting a new company. Many of these companies go on to mid-sized existence. The management talents needed to grow to the present size aren't useful to take the company to the next level. So the decision to diversify is a combination of losing both that initial excitement and finding out that the company doesn't respond the same way to the old management skills. If your company is diversifying for these reasons, you're not taking the right action.

What customers?

Assuming that you are diversifying for the right reasons, your next task is to profile your current customers. A great many questions should be asked. It's easier to profile them if you ask them in sequence:

1. What kind of demographic profile can you see among your customers? If you are in residential work, you should determine the average age, income and home value of your customers. Using these three basic variables will give you a good start on a demographic profile.

If you are in commercial work, you need to determine the type of organizations you service, how big they are and who the buyer is.

2. What is the usage profile of your current customer base? Do you have customers who receive periodic — weekly, monthly, etc.—work? Is your customer base made up of people who purchase your services on a one-time basis, like certain types of design/build work? If your customer base is mostly people who purchase periodic services, how long have the accounts been customers of your company?

3. What kind of marketing/advertising have you done in the past? There is a big difference between marketing lawn care and marketing design/build landscaping, between mowing/maintenance and tree and shrub work. You should consider your past marketing/advertising efforts with this in focus.

How have your approached your current customers? You should also consider the most efficient methods among those you use. What approaches gave you the best results in terms of customer attraction? In terms of closing percentages? You need to be aware of the past efforts and their effectiveness if you want to be effective in your future marketing.

4. Why do you believe your current customer base will buy your new offering? This question must be answered before you begin any attempts to purchase equipment, to begin a new marketing program, or to consider new personnel. For instance, many companies that were in lawn care decided to try carpet cleaning. They haven't been hugely successful. Some offerings make sense, others don't. Before you begin, consider the fact that consumer buying behavior is very different from service to service. So you must make sure your offering makes sense to your current customer base.

5. Did you check with your current customer base before you decided to offer a new service? Some companies do, some don't. There is no guarantee either way, but often it is helpful to ask your current customers what new services they would purchase. In order to get this information, you should start sending out questionnaires the year before you want to add the service, perhaps even two or three

years in a row. Most consumers will respond to your inquiries if you phrase them well enough. By listening to them, you may find that you can determine the best possible new service offering.

One word of caution. Two or three people may respond that they would like a new service. That doesn't make up a customer base. Don't take what a few people say for what a large group says. If you do, you may find that in fact you don't have a true base for the sale of your new service, but rather have a very few people who are interested in your offerings.

After you've gone through profiling your current customer base, determining why you are going to offer a new service, determining what that new service is going to be, and making sure that you have some input from your customers on how well they will accept your new offering, you can ask the final marketing/advertising question:

Two or three people may respond that they would like a new service. That doesn't make up a customer base.

6. How is your company going to reach the current customer base in order to let them know of your new offering? The basic consideration is whether to use your current advertising mechanism to advertise your new service. Will you use new mailers? Will you include your new service offerings with the invoice? Should you consider these new services as service extensions or will they be completely new offerings? Every answer given to each of these questions will help determine your advertising/communication strategy.

Summary

It's next to impossible to give answers to the above questions unless you consider each of them from a single company point of view. No one single way of introducing new services to your current customer base is correct. It depends on your current customers, the types of services you are going to offer, and how you have reached your customers in the past.

By considering all of the above questions, you should have a better planning system for marketing new services to your current customer base. **LM**

EVENTS

FEBRUARY

11-13: International Golf Course Conference and Show, Anaheim (Calif.) Convention Center. Contact: GCSAA, 1617 St. Andrews Dr., Lawrence, KS 60046; (800) 472-7878 or (913) 841-2240.

13-15: Inland Northwest Turf and Landscape Show, Spokane, Wash. Contact Jones and Associates, (509) 327-5904.

15-18: Progress and Profits in the 90s, Astro Village Hotel, Houston, Texas. Contact: Dr. L.S. Pope, 129 Kleberg Center-TAMU, College Station, TX 77843-2471; (409) 845-3808.

15-18: 20th Annual International Erosion Control Association Conference and Exposition, The Pan Pacific Hotel, Vancouver, B.C., Canada. Contact: Ben Northcutt, (303) 879-3010.

16: Connecticut Turf and Landscape Conference, Exhibition Hall, Hartford Civic Center. Contact: Anthony Penkrat, 23 Atwater St., Westhaven, CT 06516; (203) 934-3103.

16-18: Florida Nurserymen and Growers Association Spring Trade Show, Prime Osborn Exhibition Center, Jacksonville, Fla. Contact: Jennifer Franzen, (407) 345-8137.

17-18: Leaving No Stone Unturned III, Bethesda Holiday Inn, Bethesda, Md. Contact: Joel M. Lerner, PO Box 15121, Chevy Chase, MD 20815; (301) 652-1212.

21-22: Ohio State University Professional Lawn Care Seminar, Holiday Inn on the Lane, Columbus, Ohio. Contact: Sue White, (614) 292-4230.

21-23: Western Pennsylvania Turf Conference and Trade Show, Pittsburgh Expo Mart/Radisson Hotel, Monroeville, Pa. Contact: Christine E. King, Pennsylvania Turfgrass Council, P.O. Box 417, Bellafonte, PA 16823-0417; (814) 355-8010.

21-March 5: AAN International Study Program, several sites in New Zealand and Australia. Contact: Geoffery Robertson, (202) 333-1800.

23-24: Associated Landscape Contractors of Colorado Annual Conference and Trade Show, John Q. Hammons Trade Center, Denver, Colo. Contact: Diane Matt, (393) 425-4862.

23-24: Alaska Greenhouse and Nursery Conference, Fairbanks, Alaska. Contact: Cathy Wright, Alaska Division of Agriculture, S.R. Box 7440, Palmer, Alaska 99645; (907) 745-4119.

23-26: ISPO-Spring, Munich Trade Fair Center, Munich, West Germany. Contact: Gerald G. Kallman, Kallman Associates, Five Maple Court, Ridgewood, NJ 07450-4431; (201) 652-7070.

27-28: The Cash Flow of Trees, a symposium sponsored by the Penn-Del Chapter of the International Society of Aboriculture, Hershey Lodge and Convention Center, Hershey, Pa. Contact: Sara Pilling, 29 Garrett Ave., Rosemont, PA 19010.

27-28: National Institute on Park and Grounds Management Regional Seminar, Dallas, Texas. Contact: National Institute, P.O. Box 1936, Appleton, WI 54103; (414) 733-2301.

28: 12th Annual Grounds Maintenance Conference, Sheraton Columbia Northwest, Columbia, S.C. Contact: George V. Hyams, P.O. Box 12109, Charleston, SC 29412; (803) 762-1595.

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Circle No. 134 on Reader Inquiry Card

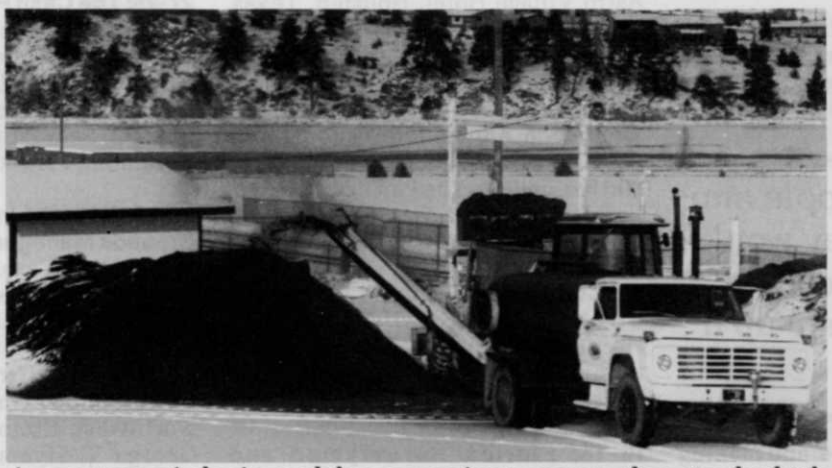
Compost: a profitable solution

by Bob Scott

For many years, fairs and shows have been in a quandary over the disposal of livestock and horse bedding. We had to get rid of it, but traditional disposal methods were no longer available.

But we have found a way to not only get rid of it, but make money at it.

Livestock shows use straw for bedding. Farmers came to the showgrounds and hauled it away. However, as the number of farmers diminished, disposal methods changed. We began dumping ours in a landfill area west of town. Since the landfill and the fairgrounds were owned by the Town of Estes Park, labor and equipment were the only costs we incurred. In 1984 however, the landfill was filled to capacity.



A cone-type grinder is much less expensive to operate than standard tub grinders for making compost. It's also safer and faster.

The problem was studied for almost one year before we decided that we'd use a private transfer station. The station compacted the used bedding and transported it by truck 37 miles down the mountain to the county landfill. However, it was soon discovered that the cost of this service was too much.

Affordable alternative

Other ideas and suggestions were kicked around, but only one option seemed to be able to handle the volume of the material the shows were producing. With the appoval of the elected officers, we purchased a used 125 hp tractor and a used tub grinder to make compost.

However, the area's sandy soil and rocks made the maintenance of this machine too expensive.

In 1987 we replaced the standard hay tub grinder with a cone-type grinder that has about 1/10th the moving parts. As a result, the machine's maintenance cost is no longer a burden.

We have ground well over 1,000 cubic yards with this new machine. It eats rooks, small pieces of lumber and about everything else except horseshoes and oil pans (exhibitors will dispose of about any and everything in the used straw pile).

The standard tub grinder would throw rocks, horseshoes and about everything else out the top of the tub, sometimes as far as 200 feet away (and sometimes through the tractor cab window).

The cone-type machine has a hopper/feed table on top that prevents foreign object discharge, which pleased our insurance carrier immensely.

During the 45- to 60-day busy season, we store the bedding and let the rain and sun start the decomposing process for us. We begin daily grinding on October 1 with the intention of grinding all the used bedding at least once before the season's first hard freeze (ice creates excessive wear and breakage, no matter what type of machine you use).

During the grinding process, we add water by connecting a one-inch hose to a fixed sprayer head at the end of the conveyor. The presence of water and air are essential if the compost pile is to heat up to the desired 160° (140° and above is the temperature needed to kill weeds, fly eggs, etc.).

The temperature will come back down in about 10 days, as the weather elements tend to solidify the outside of the pile and cut off the air. Once the temperature drops down to around 110° (we have a three-foot thermometer for testing in the middle of the pile) we grind, mix and water it before heating it up again.

We grind twice with the cone machine. If we feel there is a need for further breakdown of the material we just turn the compost pile with the loader.

With the right mixture of used bedding, water, and air we can get our first grind up to 160° within 10 days. The material is ground into windrows eight to 10 feet high and 150 to 200 feet long. From the first grind, the piles will shrink about 30 percent. After the second grinding our total finished product is about 50 percent of the starting material.

The finished compost is very much like potting soil, dark in color and with smells similar to good black dirt. The compost has some nutrient value, but it's not a fertilizer. It is a soil builder that saves water and is a very good bed for worms—which in time add air to the soil.

The end product

Compost, because it is darker than most soils, will absorb heat from sunlight, therefore extending the spring and fall seasons.

Thus far we have been able to find customers for every yard of compost we produce. Our local park department uses it for all their flower gardens by mixing it 50/50 with sand for a top dressing on the lawn areas in the fall. Local residents come to the fairgrounds with pickups and bring home a half-yard or more. We sell to landscaping contractors in 100 yard quantities and deliver bulk loads of two or more yards to consumers in our local area.

Peat moss enthusiasts, after learning about compost, tend to be some of our best customers.

For additional information on making, using and the benefits of compost, I recommend reading *Rodale Guide to Composting*, by Terry Minnich, Marjorie Hunt and the editors of *Organic Gardening* magazine. It is published by Rodale Press, Emmaus, Pa. There are, however, other books and articles about composting that you'll find helpful. **LM**

Bob Scott is manager of the Estes Park Fairgrounds in Colorado.

GCSAA • 89

International Golf Course Conference & Show

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Anaheim Convention Center, Anaheim, California

60th Anniversary

• Trade Show • Golf Championships
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Golf Course Superintendents
Association of America
1617 St. Andrews Drive
Lawrence, Kansas 66046-9990

Circle No. 130 on Reader Inquiry Card

Stump cutter is self-propelled

Vermeer Manufacturing's new stump cutter is especially designed for rental operators and commercial users.

The handle bar-style Model 206 is self-propelled, and cuts out stumps 10-½ and 21 feet above ground level.

A Kohler M20S gasoline engine operates at 19.25 hp.

Vermeer says the self-propel feature makes for easy manuevering of the 812-lb unit. The drive wheels advance the machine into the stump, giving unlimited tongue extension. Swing-away fingertip controls provide good operator visibility and solid down pressure to the cutter wheel ensures positive cutting action without fighting for control.

Circle No. 191 on Reader Inquiry Card

New tractor makes homeowners happy

The new YT6800 is the "ultimate grass cutting machine for large acreage homeowners," says Joe Stahl of Yamaha. Stahl says the company has taken the features from its YT3600 and added more power and a wider cut.

The mower is posered by an OHV V-twin 18-hp, air-cooled engine mounted in a heavy-duty reinforced steel frame and hydrostatic transmission. Other features include stellite exhaust valve seats, a pressure lubrication system with filter and electronic ignition.

Circle No. 192 on Reader Inquiry Card

Five-gang mower cuts a productive profile

The HM-11 from Jacobsen cuts an 11-foot swath to get you through the big jobs in no time. Four-wheel drive and a reel lift control make for good traction and easier cross-cutting, and an up-to-date LCD instrument panel monitors all critical functions.

The HM-11 is powered by a durable 49-hp liquid-cooled diesel engine. Jim Byrnes of Jacobsen says the mower's five hydraulically powered reels give superior cutting action and float easily over surface undulations. Soil compaction and tread marks are reduced, thanks to large tires and low ground pressure.

The four-wheel drive is a standard feature, and wide-track stance and rear wheel steering provide excellent stability and maneuverability.

Circle No. 193 on Reader Inquiry Card

Finn HydroSeeder holds 1,500 gallons

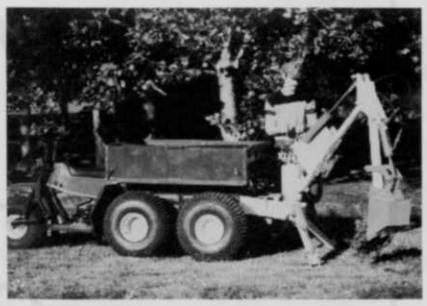
The Model T-170 is Finn Corporation's newest HydroSeeder. It has a full 1,500 gallon working capacity and a new hydraulic system, and mounts on the truck chasis or a Finn mounting bed.

A new discharge pump and piping provide for increased distance and smoother slurry flow. Slurry mixing is faster thanks to a large loading hatch and increased agitation.

Circle No. 194 on Reader Inquiry Card

Backhoe is compact, ready to work

A backhoe designed to be used in conjunction with small vehicles is now available from The Wag Co. The Hydra-Hoe has a full swing of 360°, digs to 5′, has a reach 9′ 6″ and a lifting height of 10′.



Circle No. 195 on Reader Inquiry Card

Out-front mower handles variety of cutting duties

The Pro Master from Gravely is here, complete with an 18 hp Kohler Magnum engine to power an Eaton 850 hydrostatic transaxle.

The Pro Master is designed for top maneuverability at speeds from 0 to 6.3 mph, and 0 to 4 mph variable reverse.

The mower has a zero turning radius, a 60-inch cutting deck and yoke handlebar steering that's guided by 3/16 inch aircraft cable.

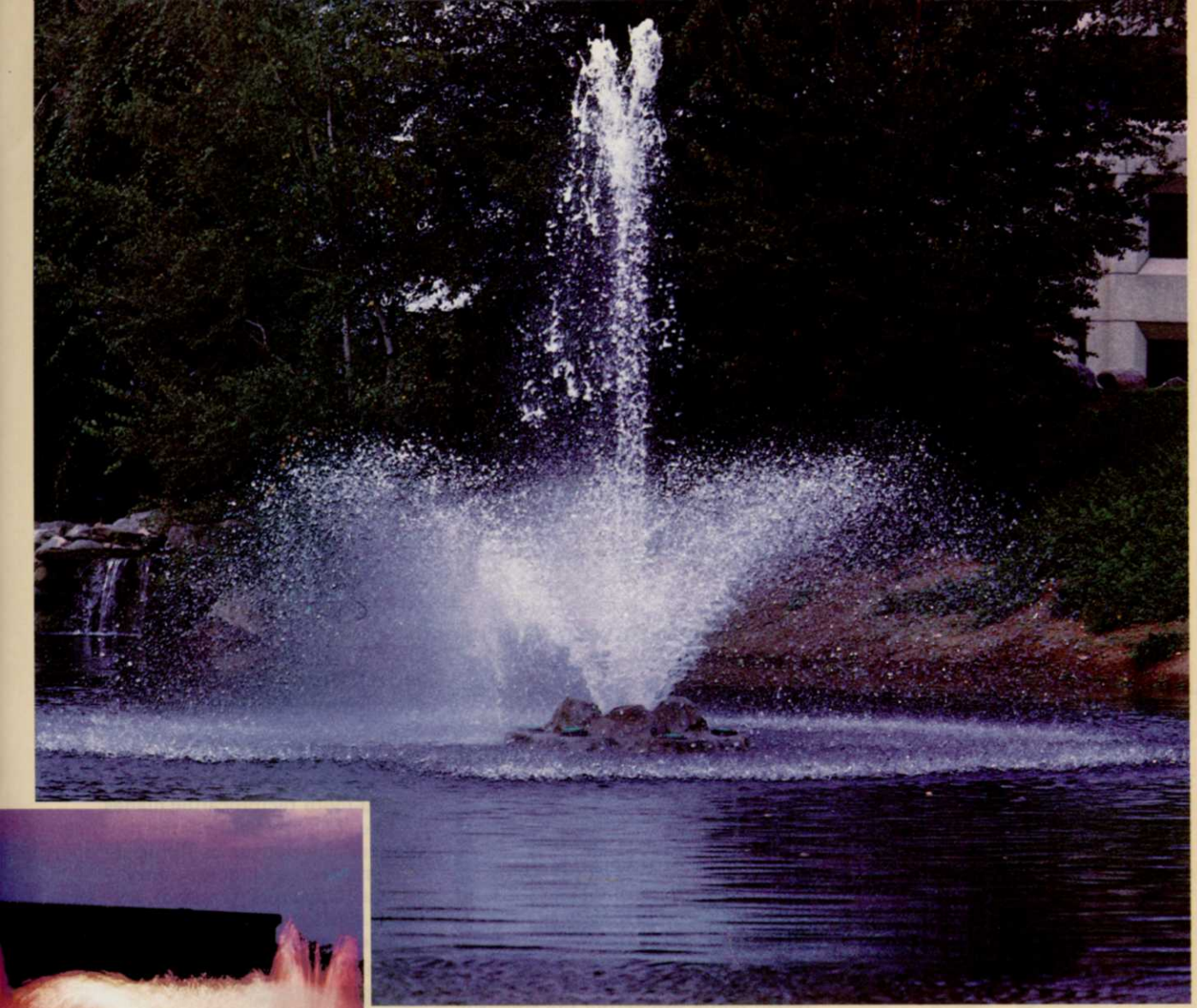
An attached tool box is standard, as is a hydraulic deck lift.

Circle No. 196 on Reader Inquiry Card

Cub Cadet mower converts to thrower, power brush

The latest Power Unit from Cub Cadet is a multi-purpose maintenance vehicle. The mower unit easily converts to a power brush or snowthrower. More attachments are being developed.

continued on page 112



Add beauty. Subtract problems.

Otterbine® Floating Aerators from BAREBO, INC. do more than just beautify your grounds. They're the natural, economical way to improve water quality. Eliminate algae and sludge. And, remove odors.

So the next time you need beauty *plus* brains, contact BAREBO, INC. We have a wide variety of aeration systems to meet your aesthetic and water quality management requirements.

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Circle No. 103 on Reader Inquiry Card

It is available in three engine sizes: 8.5, 12.5 and 15 horsepower, with 32-,

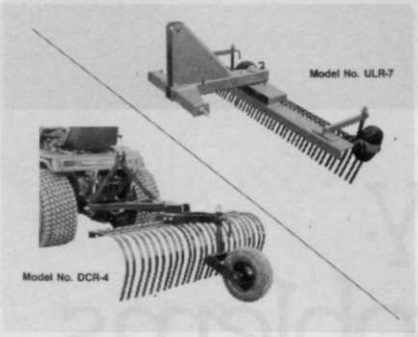
38- or 46-inch cutting decks.

Circle No. 197 on Reader Inquiry Card

Rake in all these versatile features

Worksaver, Inc. of Litchfield, Ill. offers two series of landscape rakes to prepare soil for seeding, to distribute or spread crushed stone and top soil and to clean up roots, rocks or other debris.

The DCR series features five forward and five rear angle positions, and is available in four-six foot widths. The ULR series has seven forward and seven rear angle positions, and is available in six-eight foot widths.



Circle No. 198 on Reader Inquiry Card

Publications focus on user health, safety

Issues relative to occupational safety are more in the news, and Direct Safety Company of Phoenix is right in step with six health and safety oriented publications. The new education and training materials stress safe handling of pesticides and other occupational health and safety issues for grounds supervisors.

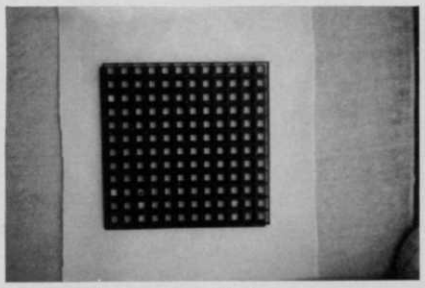
Titles include, "The Applicator's Guide to Pesticide Safety," "Working with Pesticides," "Landscape Equipment Safety Training," "The Landscape Chemical Field Handbook," "How to Prevent On-the-Job Back Injury," and "First Aid Manual for Chemical Accidents."

The books are designed to assist managers in compliance with right-to-know laws, and are described and illustrated in Direct Safety's new 1989 catalog.

Circle No. 199 on Reader Inquiry Card

Interlocking pavers handle traffic, protect grass

Golf 2000 Corporation of San Diego, Calif. now offers a system of one



square foot pavers that support heavy traffic while protecting the underlying turf.

With 140 cells per sq. ft., the pavers provide ½-inch of protection for the crown and lower blades and allow roots to grow unrestricted below the base plate.

Circle No. 200 on Reader Inquiry Card

Lesco marker keeps sprayers on track

A new foam marker from Lesco designed to be used on boom-type sprayers prevents costly skips and overlaps when applying chemical products or fertilizers.

The marker features foam generators that mount on the ends of the boom instead of at the foam tank, thus greatly decreasing the air presure required and ensuring smaller bubbles and thicker, longer-lasting foam.

The precise air/soap mixing system works like a carburator, metering soap flow into the air flow to assure consistent foam and uniform delivery.

Lesco says the foam stays light and stiff, using less soap solution per acre than systems that mix the foam at the tank.

A clog-free system features high quality components, such as a 5-gallon, stainless steel tank and cover, four stainless steel solenoids and a heavy-duty, diaphragm-type air compressor.

Circle No. 201 on Reader Inquiry Card

No strings attached to Reciprocator trimmer

RedMax has done away with string trimmers by its introduction of the Reciprocator, which does the job with two 20-tooth reciprocating blades.

The company believes the product reduces the danger of flying debris and property or operator injury.

Mas Hamamura, president, says the unit is ideal for golf courses, and can trim precisely around sand traps without tearing up the grass or kicking out sand.

Circle No. 202 on Reader Inquiry Card

Brochures tell story on walk-behind mowers

A new brochure offering information and specs on the Ransomes line of commercial walk-behind mowers is

Make this the last time you spend time changing nozzles.

Upgrade to Quick TeeJet®.

Ever notice how the little things that shouldn't interfere with getting our work done are often the things that throw us off schedule?

It's time to make sure that changing, replacing and cleaning spray tips never eats up a morning again.

Now, an easy-to-use checklist shows you how easy it is to order and install the Quick TeeJet System.

With Quick TeeJet System all it takes is a flick of the wrist to change spray tips. Pop in a new tip, give the nozzle a quarter turn and the tip is locked, aligned and ready to go. In no time at all.

The optional Chem Saver™ Diaphragm Check Valve saves money by saving chemicals. It eliminates nozzle drips when you shut down the system.

Get the brochure. Eliminate the problem.

TeeJet®

No better way to spray today's chemicals.

Spraying Systems Co. North Ave., Wheaton, IL 60188

Circle No. 169 on Reader Inquiry Card

Complete and return this coupon for the guide to ordering and installing the Quick TeeJet System on your sprayer. **LM 1**

Name _____

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City _____ State _____ Zip _____

Mail to: Spraying Systems Co., Agricultural Division, North Ave., Wheaton, IL 60188

now available from the company.

Ransomes says its walk-behinds are tough enough to handle the stresses of day-to-day use. Strong aluminum-magnesium mowing

decks, one-inch diameter double steel handles and under-deck crankshaft protectors are just two reasons why.

Three-side trimming is a standard feature on Ransomes mowers. Two optional grass catchers hold more than a bushel of clippings.

Circle No. 203 on Reader Inquiry Card

Gophers are goners with Blackhole gopher trap

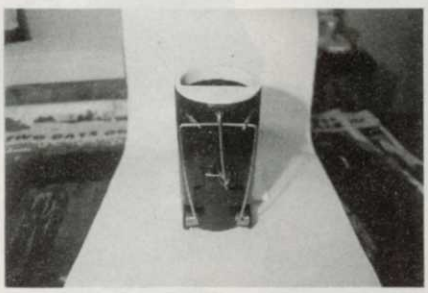
After much trial and error, inventor Jim Pidgeon devised what he believed to be the ultimate in gopher traps: the Blackhole.

Designed with the gopher's natural habits in mind, the trap is a round piece of plastic that, to the gopher, resembles the inside of a burrow. At one end is a small opening which lets in light. The gopher rushes to plug the hole and is killed by a trigger wire inside the body of the trap.

Warren's Turf Professionals markets the trap, and says more than 12,000 have been sold over the past year.

This trap is used by the USDA.

Circle No. 204 on Reader Inquiry Card



Snapper markets zero-turning mower line

Snapper Power Equipment now offers a complete line of zero turning radius riding mowers.

Designed to reduce mowing time, the mowers feature a compact design and low wide body to provide sharper

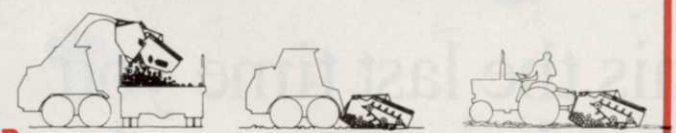
turning and close trimming. Engine horsepower varies from 12-20 hp. Three mowing decks are available, in 42-, 48-, and 60-inch widths.

A twin bag grass catcher is optional for the 42- and 48-inch mowers.

Circle No. 205 on Reader Inquiry Card

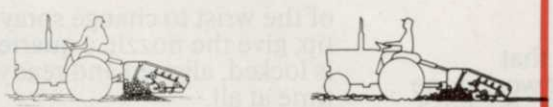
ROCKHOUND TEACHES THE ABC'S OF GROUND PREPARATION

A SERIES ROCKHOUND



Dumping — Skid Steer Mount (Hydraulic) — 3 Point Mount

B SERIES ROCKHOUND



Open bottom—Hydraulic Drive. Rocks are raked to a convenient windrow for later pickup.

COST EFFECTIVE ROCKHOUNDS Rake and collect rocks and surface debris, leaving the soil in a fluffy, level, seed-bed quality condition.

It does not cost to own a Rockhound . . . IT PAYS!

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18425 Eighth Ave. S.W., Seattle, WA 98166

Circle No. 137 on Reader Inquiry Card

Tailgate mulcher increases efficiency

A tailgate mulcher is 10 times faster than hand-shaking and uses 20 percent less straw, according to TGMI, Inc.

The TGMI Tailgate Mulcher has a two-bale-per-minute capacity with 30-foot discharge. With a 50-foot hose, it can mulch 150 feet before moving the truck.

According to Phil Faber of TGMI, the mulcher can disperse three tons of straw mulch per hour, using two men—a feeder and a sprayer.

The unit is made in the United States from domestically-manufactured parts.

Circle No. 206 on Reader Inquiry Card

Keep weeds out, let precious water in

Tensar porous landscape fabric blocks out more sunlight for better weed control and greater moisture savings, its manufacturer claims. Also, the fabric has longer service life because it resists sunlight breakdown and is specially treated to let water in faster.

continued on page 116

PHOTO BY THOMAS DEVOL

Discover Why Americans are Taking Cycling to Heart

Today's Americans are re-discovering one of the safest, healthiest, family recreational activities. Cycling!

You don't have to join a club or take expensive lessons. Gliding along at any speed strengthens your heart — just ask your doctor!

So visit your local bicycle retailer today and start cycling. Your heart and family will thank you!

P.S. Remember to always wear a helmet!

EDGELL EXPOSITIONS

SPONSORED BY BICYCLE DEALER SHOWCASE MAGAZINE AND BDS EXPO

A DIVISION OF EDGELL COMMUNICATIONS, INC.

Range of uses is from bushes and shrubs to under wallways, to rock gardens and other hard landscaping, to under decks and patios.

According to Tensar, mold, fungus or bacteria won't grow on the fabric. Tensar can be cut with kitchen scissors and drapes the ground well for more attractive landscaping.

The fabric prevents soil from mixing from bedding material while at the same time reducing erosion and soil compaction caused by heavy rains.

Circle No. 207 on Reader Inquiry Card

Hydraulic accessory kit lets you edge, mow and pick up

A new hydraulic accessory kit from Excel Industries lends three-in-one convenience to existing Excel mowers.

The Hustler edger attachment lets the operator edge while mowing or driving along curbs, drives or sidewalks, with no backtracking.

The Hi-Lift Bac-Vac grass catcher attachment is a 15-bushel hopper that raises hydraulically 4½ feet. Convenient behind-the-driver placement does not hamper the Hustler's maneuverability.

The accessory kits are available for

Hustler Models 320, 340, 400 and 440.

Circle No. 208 on Reader Inquiry Card

Jacobsen LF-100 mower a true 'lightweight'

Jacobsen's LF-100 lightweight fairway mowers promise a new level of fairway care, thanks to newly designed 22-inch reels.

According to the company, the new mower has a 100-inch cutting width with five reels. Outside reels are positioned up front for easier mowing and increased productivity.

To ensure that the mower does the

job, Jacobsen conducted a field test of all units made during the first week of production. All performance areas were checked, including cutting quality, speed and climbing power and hydraulic pressures.

Circle No. 209 on Reader Inquiry Card

New rotor designed for all turf grass applications

The new R-70 rotor from Rain Bird is ideal for sports fields, parks and industrial sites, and combines many of the latest features.

Service and down time is minimized by a self-cleaning, water lubricated piston drive which allows sandy or effluent water to pass straight through the rotor. The piston drive uses less than two percent of the water passing throught the unit to drive the head, increasing throw distance without increasing pressure requirements.

Rain Bird has also designed color-coded, interchangeable nozzles to increase throuw distance by minimizing water turbulence.

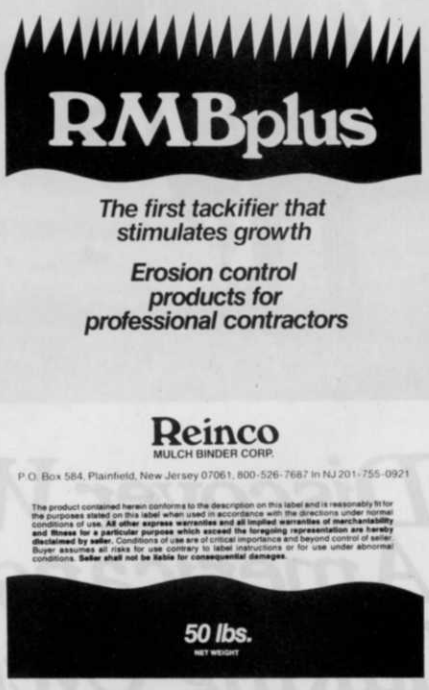
For added safety and less damage, the R-70 has a 2½-inch exposed case diameter. An optional rubber cap is also available.

Circle No. 210 on Reader Inquiry Card

Reinco debuts new tackifier

Reinco Mulch Binder Corporation has introduced RMB Plus tackifier stimulant, containing a growth stimulant to promote plant development.

Reinco says RMB Plus can also be used as a fiber mulch binder and as an


RMBplus
The first tackifier that stimulates growth
Erosion control products for professional contractors
Reinco
MULCH BINDER CORP.
P.O. Box 584, Plainfield, New Jersey 07061, 800-526-7687 In NJ 201-755-0921
50 lbs.

erosion inhibitor.

The product is normally mixed with water and fiber mulch in a hydrograsser and sprayed onto a seedbed.

Circle No. 211 on Reader Inquiry Card

Tests Prove Bio-Groundskeeper™ is Best for Thatch Reduction*

"Bio-Groundskeeper™ has shown excellent results...it makes our job easier..."

Jerry Haupt, Lakeland Landscape Services, Inc., Manitowoc, WI.

"I'm very pleased with KLM Bio-Systems' product."

Robert Hansen, Groundskeeper, New York Jets.

*** Michigan State University research rated Bio-Groundskeeper™ most effective for reducing thatch.**

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Circle No. 136 on Reader Inquiry Card

Some of life's best lessons are learned in the school of 'soft knocks'

The young man on the left will fall several times before he hits his first home run. The young man on the right wants him to have the advantage of falling on real turf.

We think it's curious that the same lawmakers who insist that individuals and corporations make environment and products safer for children neglect to legislate safer standards for school playgrounds.

It's no doubt easier to make us spend our own cash to improve conditions than to appropriate public funds for safe playing areas.

Things are changing . . . slowly . . . but NSTC has been instrumental in distributing information and talking to some appropriate people, but it all takes time and money.

While we're waiting for the big picture to change, we can all improve our little corner . . . like planting an improved turf plot of our own, then using it! When officials see how much more fun we're having, they'll no doubt want in on the action.

For free brochure and membership application, call or write to Fred V. Grau, Chairman

NSTC
NATIONAL SPORTS TURF COUNCIL

USDA • ARS • BARC
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BOOKSTORE

010 - ADVANCES IN TURFGRASS PATHOLOGY
by Joyne, and Larsen
Leading U.S. turf pathologists report on turfgrass diseases, pythium blight, snow molds, fairy rings, leaf spot of Kentucky bluegrass in Minnesota, initial and field fungicide screening, turfgrass disease resistance, etc. Contains new ideas on how to combat turfgrass problems. **$27.95**

235 - LAWN CARE: A HANDBOOK FOR PROFESSIONALS
by H. Decker, J. Decker
Written by turfgrass professionals, this handy guide will be invaluable for playing field managers, golf course managers, or any lawn care practitioner. Covers all aspects of turfgrass management. **$36.00**

645 - MANAGEMENT OF TURFGRASS DISEASES
by J.M. Vargas
Identifies turfgrass diseases by description and illustration. Includes a holistic approach to healthy turf and lawns. Presents practical management strategies for golf courses, lawns and athletic fields. 204 pages, illustrated. **$26.70**

620 - TURF MANAGEMENT HANDBOOK
by Howard Sprague
Practical guide to turf care under both healthy and poor turf conditions. Chapters cover turf in cooler and warmer regions, fertilizer use, regular turf care, weed and disease control and special turf problems. Useful seasonal schedules for management of turf areas. **$25.25**

220 - CONTROLLING TURFGRASS PESTS
by Shurtleff, Fermanian, Randell
New comprehensive guide provides the most up-to-date information available on the identification, biology, control and management of every type of turfgrass pest. **$36.00**

640 - TURF IRRIGATION MANUAL
by James Watkins
A guidebook for engineers, architects, designers and contractors. Keeps pace with the latest developments in turf and landscape irrigation. Specific chapters devoted to rotary sprinkler design systems. Golf course design systems and expanded engineering and reference material. **$27.25**

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by James Beard
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110 - TURF MANAGERS' HANDBOOK-Second Edition
by Daniel and Freeborg
ENTIRELY UPDATED. A practical guide for the turf practitioner. Chapters on grasses, growth regulators and diseases have had extensive modification. Innovations resulting from research and practice have been added to reflect the current techniques available for turf managers. **$32.95**

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225 - TURFGRASS MANAGEMENT
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by James Beard
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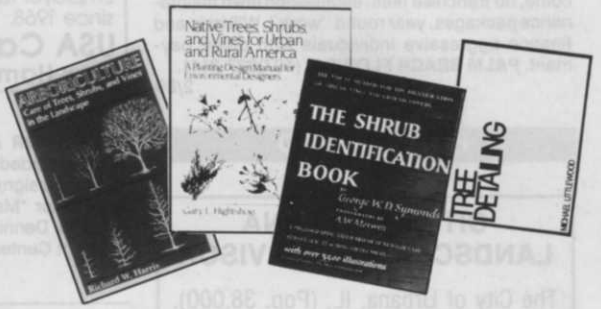
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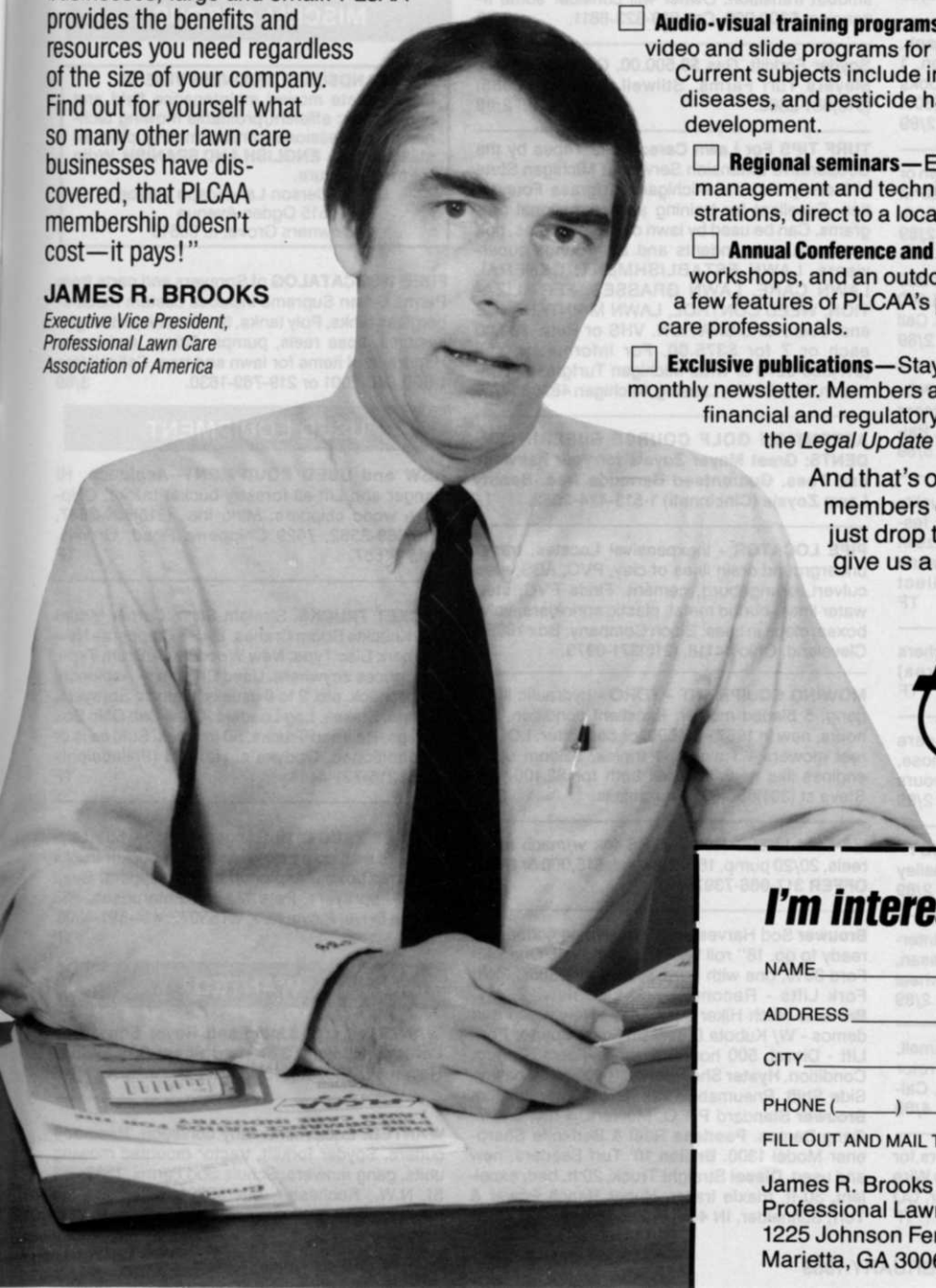

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PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

Controlling pine needle scale

Problem: *Can pine needle scale be controlled using dormant oil? (Michigan)*

Solution: Pine needle scale is an armored scale. This group of scale insects is difficult to manage. General recommendations for scale management usually include a dormant oil spray followed by one or two sprays when crawlers are present.

Some extension publications recommend Ethion combined with horticultural oil for armored scale control. Douglas Caldwell, Ph.D., our staff entomologist and manager of research and development at Davey, says, "Dormant oil could be interpreted as either a dormant oil product or the season when the application is made (or both). I assume you are referring to the dormant season. Applications of a 'horticultural' grade oil would probably not give adequate control if the application was made sometime between October and April (dormant time). This is because this scale species overwinters under the old female cover (scale) in the egg stage.

"The theory is that the oil will not penetrate enough to come in contact with all of the eggs, as the eggs are sometimes stacked on top of one another. A few armored scale species (euonymus scale and white peach scale) overwinter as females. Results (control) with oil are better since there is only one individual under the scale cover.

"The most opportune time to use oil (at 2 gal. per100 gal.), based on work done in several states (New York, Pennsylvania, Colorado), is shortly after the second generation crawler period, which would place the application time in early to mid-August in your area."

The oil will kill settled crawlers and second instars.

"For some reason, control with oils during the first generation crawler period (middle to late May) is not as effective. However, you could try using Dursban, Sevin, Orthene or Diazinon during the first generation crawler period. A third application (2% oil) could be made in middle to late August to control mature females before eggs are deposited.

Effective Oftanol applications

Problem: *Oftanol has usually been my "right-hand material" for season-long grub control, but for the past two seasons it has not been all that effective. Application was accurately and carefully done. What other factors could have contributed to reducing the effectiveness of this pestiicide? (Maryland)*

Solution: The poor performance of Oftanol for grub control that you are explaining has also been reported by other professionals in the industry. Though Oftanol is still considered to be one of the better products with longer residual effect for grub control, in recent years it failed to perform as expected in a number of cases.

Consider the following factors if Oftanol isn't meeting your expectations:

1. Improper timing, either too early or too late. Ideally insecticide applications should be made to control larvae in the fall. Mature grubs in the spring are more difficult to control.

2. Pre- and post-watering. The most commmonly used materials (including Oftanol) are organophosphate insecticides which have a relatively short residual effect in soil and have a tendency to bind to thatch. Therefore, watering is recommended to improve their effectiveness. Unless surface-applied material are thoroughly watered in, grubs can continue to cause damage.

3. Dry soil conditions, improper movement and inactivity of materials.

4. Possible bacterial degradation of Oftanol in some specific soil types.

Reports suggest that some soil types may contain certain Oftanol decomposing bacteria that can affect its results. This will result in enhanced degradation of Oftanol and possibly other organophosphates or carbamates such as Sevin.

Some of these factors individually or cumulatively may have contributed to the lack of results with your grub problem.

Identify the causal factors and try to correct them before using the products again. Read and follow label specifications for best results.

Hard-to-control weeds

Problem: *In Hawaii, we have a problem getting rid of prostate spurge and woodsorrel. I have tried many ways with varying results, most not good. What would you recommend? (Hawaii)*

Solution: Prostate spurge and woodsorrel weeds are considered to be difficult-to-control weeds. Generally, Trimec (containing 2,4-D, MCPP and dicamba) herbicide is not very effective against these weeds. Mixtures of 2,4-D with 2,4-DP or triclopyr can give better results. Either amine or ester formulations of these products should be able to provide good results.

Target the spray applications when the weeds are actively growing. If you are planning to use an ester formulation, be careful around non-target desirable broadleaf plants. Ester formulations are volatile and can cause injury to nearby plants under certain conditions. Read and follow label specifications for better results. **LM**

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

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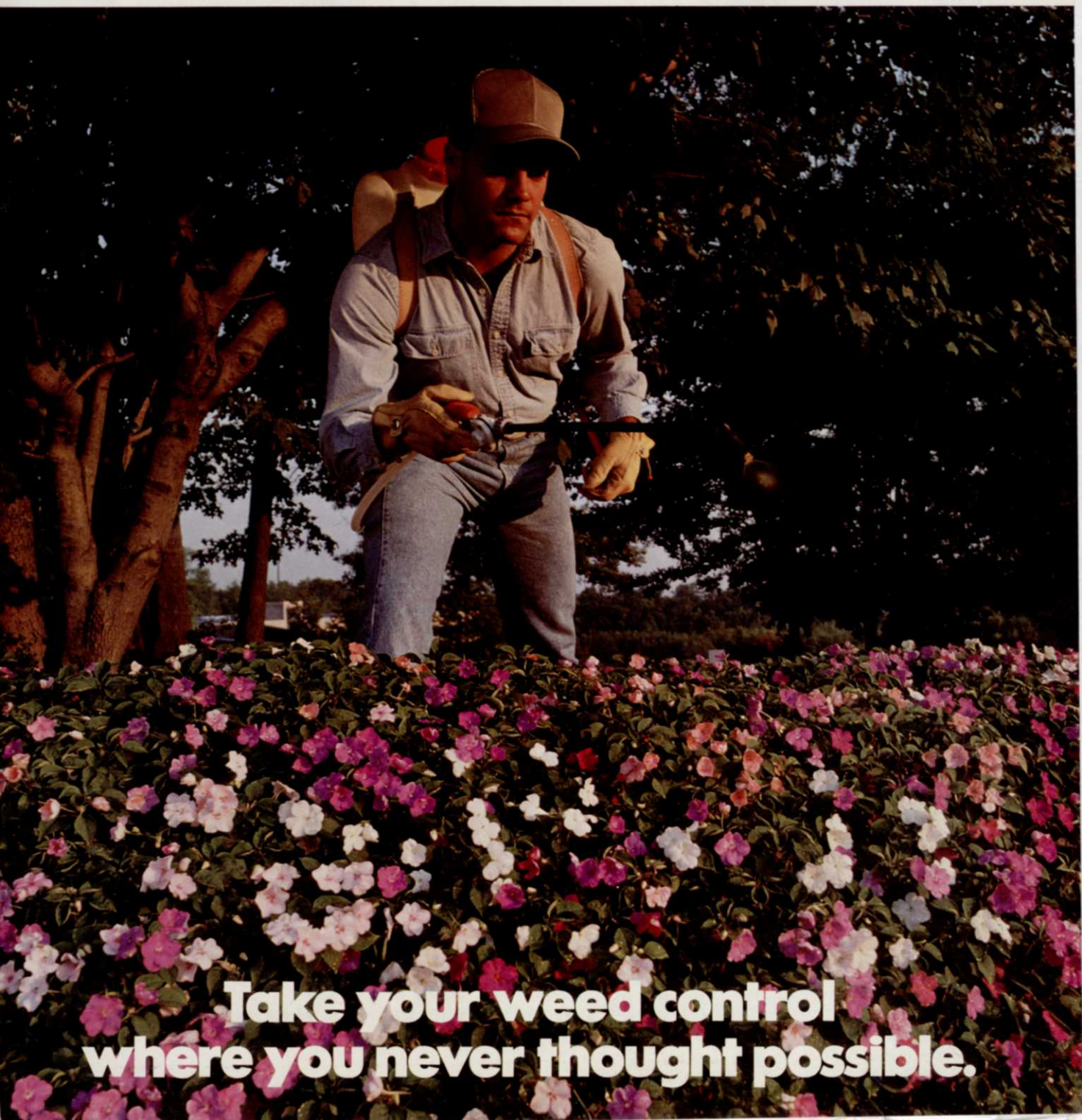

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